



The Marketing Research Corporation of India

**SURVEY  
of  
INDIA'S EXPORT POTENTIAL  
of  
SPICES**

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SURVEY  
OF  
INDIA'S EXPORT POTENTIAL  
OF  
SPICES

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AN EXPORT FEASIBILITY STUDY FOR INDIAN SPICES

PEPPER







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## I. SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

The Size of  
World Trade

The per capita consumption of pepper in the largest markets in the United States and Western Europe tends to remain stationary. There is however, a slight movement upwards in the United States believed to be due to a pepper preference amongst younger people for seasoned foods. An average rate of growth of total consumption of about 3 per cent over these markets can be assumed over the next decade.

1.2 By contrast, in countries which are less affluent but are set on the stage towards mass consumption, a significantly steeper rate of growth of consumption has been demonstrated. In the Soviet Union and many States of Eastern Europe the market for black pepper could grow for a decade at a rate of between 5 to 6 per cent per year.

1.3 In the light of these somewhat variable tendencies a global rate of growth of nearly 3.5 per cent per year is in operation. Applied to current world trade of between 65,000 and 70,000 tonnes, this points to world trade of about 85,000 tonnes in 1971 and nearly 100,000 tonnes in 1976.

India's share  
in World Trade

India is currently meeting a declining share of world trade in pepper. In 1954 we supplied nearly half the pepper in world trade. In 1965, our peak year by volume, we supplied a little



over a third. If world consumption should rise as expected to 110,000 tonnes by 1971 and world trade to 85,000 tonnes, export of 30,000 tonnes from India would hold a little over a third of world trade in that year.

2.2                    A minimum export performance of 30,000 tonnes is suggested for 1971; the corresponding figure for 1976 proposed is 36,000 tonnes. Domestic consumption in 1971 will probably not be less than 12,000 tonnes; it may be higher at 14,000 tonnes by 1976. This suggests that production targets should be not less than 40,000 tonnes in 1971 and 50,000 tonnes in 1976.

Production            If estimates of 32,000 tonnes for the crop of 1967 are accepted, a programme for production for 1971 implies an addition of about 10,000 tonnes in four years. This cannot be achieved except by a determined effort to raise productivity in areas where inputs of fertilizer sprinkler irrigation and improved varieties can make a rapid advance. Very little can be accomplished rapidly in household cultivation areas.

3.2                    Even allowing for some success with the new proved strain of Panniyur I, an assured crop of 40,000 tonnes by 1971 will probably not be obtained except with incentives.

3.3                    However, Panniyur I has not yet been thoroughly tested in regards to its fertilizer requirement/s,



disease resistance and other qualitative characteristics like pepperine and non-volatile oil contents.

3.4 We recommend that this testing should be taken up immediately and the results of it made public so as to make this variety of pepper more acceptable to the farmers.

3.5 It is obvious that produce from the new variety will not be available for the next 4 to 5 years. To increase production in this period, we will have to largely depend upon other agricultural inputs like fertilizers, irrigation and pesticides.

3.6 The eradication of wilt disease should also receive immediate attention.

3.7 The irrigational facilities should be made more extensive and cheaper. The present water rates are found uneconomic by a number of cultivators.

3.8 The supply of fertilizers should also be made easy. Since pepper growing is also partly done in households, it is important that fertilizers and plant protection chemicals are distributed in small packings with easy-to-follow instructions.

Prices There have been large fluctuations in the price of pepper though for the last 4 or 5 years its price has been nearly stabilized because of pressures of demand from the U.S.S.R. and East Europe.



4.2 Since about 5,000 tonnes of pepper are being offered in excess of demand and this quantity is subject to wide variation, it will be appropriate to keep a mechanism of buffer stocks ready for operation in case the need for such a buffer stock arises.

4.3 This buffer stock may consist of both ASTA and FAQ qualities of pepper and in the event of an agreement with Indonesia as is proposed separately, the buffer stock may include Lampong also.

Trade Diversi- The Marketing Research Corporation of  
fication  
India is of the opinion that excessive  
reliance on one market is unfortunate.

5.2 Particularly so because the U.S.S.R. and the East ~~European~~ markets can be switched off as a result of political decisions at the top.

5.3 Though we do not consider this to be an eventuality in the immediate future, we recommend that urgent steps be taken to diversify our trade.

5.4 Attempts should, therefore, be made to recover the United States market as also increase our exports to other countries in American and West European zone from where free convertible currency may be earned.

5.5 We recommend that we should attempt to export about 6,000 tonnes of pepper to the U.S.A. by 1970-71 and about 7,500 tonnes by 1975-76.



White Pepper      The Marketing Research Corporation of India has arranged for examination in the United States the samples of ground white pepper prepared by the Central Food Technological Research Institute, Mysore. These have not been approved. Detailed further tests will need to be arranged.

6.2                      Meanwhile the differential in favour of white pepper does not cover the cost of production of white pepper.

6.3                      The market for white pepper which largely exists in the Western Europe is nearly stationary if not shrinking and yielding place to black pepper.

6.4                      The current differential between the prices of white pepper and black pepper is negligible.

6.5                      In view of these factors, the Marketing Research Corporation of India recommends that though the experiments for production of white pepper may continue and cheaper methods for its production may be evolved, we should not go into production of white pepper for some time to come.

Light Pepper      The Prevention of Adulteration Act currently prevents light berries sale in excess of two per cent.

Light pepper is grown on the same vine as the black pepper and is a natural product fit for human consumption except



that its starch content is generally higher. Its essential oil is no less than heavier pepper.

7.2 The restrictions on its consumption in the domestic market seem copied somewhat uncritically from more advanced countries like the U.S.A. but the tolerance there is higher at 4%.

7.3 India is a producer country and should not impose restrictions on the consumption of its own produce which the importers choose. Heavy berries are in demand abroad and are in short supplies.

7.4 There should be no restrictions on the domestic consumption of light pepper so that all foreign demand for "bold" peppers can be met and larger foreign exchange earned.

Communication Serious complaints exist as to lack of communication between the points of export of spices like Bombay and Cochin and the important producing centres.

8.2 At times delays in establishing contact by the exporter with the producer or the supplier have resulted in delay in quoting a price in response to an enquiry from abroad and this has resulted in loss of business.

8.3 We recommend that immediate steps should be taken to improve the internal communication system, particularly telecommunication, between Cochin and Bombay and



the producing centres by bringing these centres on direct line.

Pin-heads                      There is no market for pin-heads inside the country. These are, however, sold in the international market at an appropriate low price.

9.2                      The current price of pin-heads from India is not competitive because of an excessive export duty of 50 Paise per Kilogramme.

9.3                      The export duty of 50 Paise per Kilogramme on pin-heads should be abolished to make export possible, particularly as domestic consumption is restricted.

Packaging                      We have studied the marketing system for processed spices in most advanced countries with their great dependence on supermarkets or large Departmental Stores.

10.2                      We have also studied the profitability of such an operation and concluded that the profit rates prevailing, which work out to be about 6 per cent only even in the case of world's largest concern like McCormicks, do not warrant undertaking of such projects in India without a prior detailed study as to its economic feasibility.

10.3                      The feasibility study should, in detail study the market for packaged spices in the neighbouring countries in the Middle East and in South East Asia. It



should also work out the foreign exchange requirements of such a venture.

10.4                    If as a result of the detailed study recommended here the establishment of a packaging plant is considered advisable, we recommend that the project may be started in collaboration with an international firm, the reputation of which is beyond doubt.

10.5                    This collaboration arrangement, in our judgement, should be entered into with firms of standing similar to the McCormicks of the U.S.A.

Cleanliness            We should adopt higher standards of cleanliness. For this purpose cleaning machines should be imported freely.

Quality Control            In order to make stricter standards operative, we recommend that test laboratories should be set up in Cochin and Bombay which should be largely based on analytical tests as perfected by the ASTA Research Committee.

12.2                    Agmark should be converted into a Government guarantee for quality. In case the description on the Agmark certificate differs from the contents of the package, the Agmark giving agency should hold itself responsible for it. This agency should, in that event, compensate the buyer (importer) for such a difference.

Arbiration                In the event of an arbitration case going



against the Indian exporter, the dues should be paid forthwith.

13.2 This may be done by placing a revolving fund at the disposal of our embassies abroad.

13.3 Our estimate is that an amount between \$ 25,000 to \$ 50,000 placed with our Embassy at New York will be enough to meet the requirements of this system. Much smaller amounts may be required at London.

Ware-           Appropriate warehousing facilities should be  
Housing           provided both to maintain current crop as also  
the buffer stocks. These warehouses should be rate-free  
as also in good sanitary conditions. This is particularly  
important because Indonesia has recently established  
several such warehouses with very good results for export  
performance.

14.2 Storage experiments at port godowns should be conducted to study absorption of moisture during storage.

Invest-           Greater attention should be paid towards in-  
ment           vestment in this field. Machinery should be  
allowed to be imported freely for purposes of cleaning and  
driage. Import of grading equipment should also be allowed  
freely.

15.2 This is urgent because of steps recently taken by Indonesia in this direction which has made a marked difference in quality to their export performance, particularly in regard to exports to the U.S.A.



15.3 Machinery for product diversification should also be allowed freely. This machinery should be utilised for the manufacture of oleoresins, spice oils or other products that may be used for industry or pharmacy.

15.4 Undue emphasis must not be placed on indigenous substitution in regard to machinery required for promoting exports such as the cleaning and the driage machinery. The industry should be allowed to make its own choice on the basis of comparative prices and the likely quality of output.

Marketing Delivery delays should be minimised.

16.2 Attempts should be made to build up an integrated marketing system in the important marketing centres of pepper so that international quotations are properly displayed and information regarding international demand, supply and prices is disseminated quickly.

16.3 Market intelligence is a specialized task. This may involve training and research. Adequate amount of foreign exchange required for this purpose may be made available to the interested agencies.

16.4 Some discrimination in ocean freight rates arises because of use of conference liners by India and of non-conference liners by Indonesia. Effort should be made to so adjust the freight rates that these are same for all the supplier countries.



Product Diversi- fication	Production of oils and oleoresins should be encouraged.
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17.2            Attempts should be made to find out various uses of pepper like the pharmaceutical and the industrial uses. It may be that greater processing is involved in order to meet pharmaceutical or industrial requirements. This will increase the value added portion in the total exports and result in increased share for India in the total consumer outlay on pepper and pepper products.

Publicity and Pro- motion  foods.	There should be increased participation in trade fairs particularly fairs which display
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Statis- tics	Immediate steps should be taken to improve production area and yield statistics.
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Finance	Increased attention should be paid to to the provision of finance particularly to the growers as this sector is generally short of finance. For this purpose, co-operatives at village level should be strengthened in regard to finance.
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Insurance	Crop insurance should be undertaken by the State against disease and failure of monsoons.
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Spice Trade Associa- tion	A Spice Trade Association on the lines of ASTA is recommended. This association should have various committees which should maintain liaison with: a) the Government, and b) the quality control
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authorities. It should also have a committee for publicity abroad.

22.2 To study the economics of pepper production, the incidence of Central and State taxation on this sector as also the facilities desired for increasing production and exports of pepper should constitute its major objectives.

22.3 A wing of this association should devote its attention to cost reduction in the production of pepper. This wing should form itself into an advisory panel for cost reduction.

Export Houses      Opening of export houses should be encouraged.

Rupee Trade      We have a fairly established trade with the rupee account area which particularly in the case of pepper, is to our advantage. While it is necessary that our exports of pepper are diversified, this diversification should go together with the consolidation of our trade levels with the rupee account area.



Pepper comes from the dried berry (called a peppercorn) of a woody, climbing vine. Its botanical name is *Piper nigrum* L. - no relation to the red peppers which give us sweet red and green peppers and the hot, red peppers. A native of the East Indies (Indonesia), pepper is now cultivated in the tropics of both eastern and western hemispheres. While it does grow wild, most of our pepper today comes from cultivated plants. Production ranges from plantation scale to home garden, depending on the area growing it. The vines, which have large ovate leaves (resembling philodendron) are trained to climb support trees or stout poles of 12 feet or so in height. Since several cuttings are planted around each support, the vines eventually resemble tall, very thick bushes.

It takes three to ~~seven~~ years before a vine comes into full production. (The maturing period varies according to area and techniques of cultivation).

The pepper berries grow in spike-like clusters of roughly four to six inches in length (varying according to type) and bearing 50 or more berries. As they ripen they turn from green to yellow and then to red.

Black or White Pepper    If the end product is to be Black Pepper, the berries are picked while still immature and then dried. The entire berry or peppercorn is used for this



spice. As the berries dry, the skin wrinkles and turns to deep brown or black. When ground, the peppercorns yield a powder of light and dark particles - a combination of the dark skin and light coloured core.

White Pepper is produced by removing the dark skin and using only the core. First, the berries are left to ripen longer on the vine. This makes it easier to remove the skin. After they are picked, these mature berries are soaked in running water for about 8 days to loosen the skin as much as possible and then rubbed to remove it entirely. The cores, or white peppercorns, are then put out in the sun to dry.

It is also possible to produce a white type of pepper from dried black peppercorns by removing the skin in a machine. This is known as "Decorticated Black Pepper", or sometimes called "Decorticated White Pepper". It can be used interchangeably with white pepper from a colour standpoint, but in flavour it is more reminiscent of black pepper.

**Malabar Black Pepper** A major portion of the world's Black Pepper comes from the south-western shore of India, known as the Malabar Coast. There are two main producing districts - Alleppey in the South and Tellicherry in the North.

Prior to World War II it was common to call the pepper of the southern district "Alleppey", after one of the



two major shipping ports there (Cochin is the other). However, this type of pepper is now more generally called "Malabar".

As with Indian Pepper in general, Malabar Pepper is highly aromatic, with a distinctive fruity bouquet. It tests high in steam volatile oil and non-volatile Methylene Chloride extract, properties responsible for its excellent aroma, flavour and pungency.

Telliche- The Pepper of the northern Malabar Coast is rry Black Pepper known as Tellicherry Pepper. In addition to possessing the excellent flavour and pungency properties noted above in Malabar Pepper, it is characterised by what the spice trade calls "bold" berries - large, very regular and good looking specimens. Tellicherry traditionally commands the highest price among peppers; it is a product long prized by gourmets. Historically, the sausage makers of Italy have been some of the major customers for Tellicherry Pepper, using it in cotto and other salamis. They choose the large, bold peppercorns both for flavour and the appetizing appearance they give the sausages. During recent years bold tellicherry pepper has come in increasing demand in the U.S.A. as a result of the widespread use of the pepper mill.

Both Malabar and Tellicherry peppers are marketed only as Black Pepper. The Indian berries are not easily husked or decorticated.



Lampung Black Pepper      Indonesia - principally the island of Sumatra - is another major producer of fine quality Black Pepper. Cultivation is centred in the Lampung district of south-eastern Sumatra and shipments are made from the port of Pandjang. Lampung Pepper reaches the U.S. via Singapore or direct from Indonesia.

Lampung peppercorns are quite uniform in their properties. This pepper compares with Malabar in pungency and flavour, testing high in steam volatile oil and non-volatile Methylene Chloride extract. The berries are small and thin shelled and are suitable for machine decortication. Ground Lampung Black Pepper is relatively light in colour.

Sarawak Black Pepper      The former British Colony of Sarawak (now part of the Federation of Malaysia), along the north-western coast of Borneo, ranks third in world pepper production. Its output is largely shipped from Kuching, the capital, and major port, but most of the pepper is then transhipped through Singapore. Ground Sarawak Black Pepper is a very light coloured product, mild in flavour, low in volatile oil, non-volatile ether extract and Methylene Chloride extract. Most of the Sarawak Pepper goes to British Commonwealth nations.

Brazilian Black Pepper      Brazil is the newest commercial producer of Black Pepper. A large part of its production is handled by a single marketing co-operative on the Amazon



River in the northern State of Para. Pepper cultivation was started in the jungles there in the late 1920's, but the first major exports were not made until after World War . II.

Brazilian black peppercorns have a relatively smooth surface and characteristic appearance. The outer skin is black and the centre of the berry very white, causing a sharp black and white contrast in the appearance of the ground pepper. It is low in steam volatile oil and non-volatile Methylene Chloride extract and its flavour characteristics make this pepper less desirable than the Tellicherry, Malabar and Lampong varieties.

Ceylon Black Pepper      Ceylon Pepper is shipped out of Colombo, the capital and major sea-port. It is a pepper which is characteristically high in volatile and non-volatile oil content which makes it favoured by the extraction industry. It is only available seasonally and in limited quantities.

Muntok White Pepper      The island of Bangka, which lies off the south-eastern coast of Sumatra is our major source of White Pepper. It is shipped from the ports of Pangkalpinang and Muntok, hence the name. Muntok White Pepper has its own characteristic aroma and, as with White Pepper in general, has a relatively mild flavour. All the Muntok's crop traditionally goes into White Pepper production.



Brazilian White Pepper      A portion of the Brazilian pepper berries are left on the vines to mature and then turned in- to White Pepper. The Brazilian White Pepper when ground is lighter in colour and less pungent than Muntok White Pepper.

Sarawak White Pepper      While Sarawak produces a certain amount of Black Pepper, as previously mentioned, the major share of its crop is normally reserved for White Pepper. However, hardly any of it reaches the U.S.; most of it is exported to Europe and the British Commonwealth.

Other countries that grow pepper are Madagas- car, Cambodia, Jamaica, Ivory Coast and Haiti. Both the level of production and the level of exports in these countries is not significant in the context of world pro- duction and the world trade.



### III. METHODS OF CULTIVATION

The black pepper plant is a climbing vine native to the forests of the south-west coast of India and is grown for its berries which are dried to produce the pepper of commerce.

Botany      The pepper plant may attain a length of 30 feet or more. The young stems are swollen at the joints and become woody on aging. From the joints numerous rootlets are produced enabling the plant to attach itself to a tree or other kind of support. The leaves are oval or ovate in shape and end in a sharp point. They are dark green and shiny above, pale green underneath, and of a rather leathery texture. They are borne on short stalks or petioles, are without stipules and are arranged alternately about the stems. The flowers are very minute and are borne in catkins, produced at the nodes opposite the upper leaves. In the case of the wild pepper plant the flowers are usually unisexual, the plants being either monoecious or diecious. For cultivated pepper gardens the hermaphrodite forms are preferred.

The fruit is berry-like and sessile. At first as it ripens it becomes yellow, afterwards turning bright red. At the same time the catkins lengthen. Each fruit contains a single seed, enclosed in a pericarp in a pulpy layer. Pepper vines flower during the wet season and mature their fruit in about six months after flowering.



Vines raised from cuttings produce for the first two or three years purely vegetative runners. In the third and fourth years they begin to produce flower spikes which are sympodial (i.e. the extension in growth is made from a side bud). For a few years more, monopodial vegetative growth (i.e. growth arising from the terminal bud) continues vigorously along with the production of fruiting branches. There is a marked reduction in the production of vegetative runners as the vine ages. It is not uncommon for the vines to bear for 30 years or more.

Vegetative runners bear aerial roots which adhere well to the "standard" or support. Leaf petioles on vegetative runners are two or three times longer than those on the leaves of the fruiting branches, with a proportionate reduction in the size of the leafblade.

Lack of purple pigmentation distinguishes a fruiting bud from a vegetative one.

Flower structure varies with sexuality. Hermaphrodite flowers consist of a pistil having a star-shaped stigma, the stigmatic rays from three to five in number, and two stalked stamens one on each side of the ovary. The stigmatic rays are felted with long hairy growths and the tips are somewhat swollen and bulbous. The pollen grains are generally seen enmeshed between the hairs.



Dehiscence does not scatter the pollen grains. The agency for scattering pollen grains is the heavy falling of rain drops. Pollination is apparently not done by insects.

Pepper, being a native to Malabar on the southwest coast of India, thrives in a hot humid climate. It has, however, been successfully grown as far north and as far south at the 20° latitudes. Its cultivation is normally confined to an altitude range from sea level to a few hundred feet elevation, the upper limit of cultivation being about 2,500 feet. It demands a wet climate, and less than 100 inches rain per year is generally considered to be insufficient. The rainfall should be evenly distributed, although pepper appears to be able to tolerate a dry season of some duration. As would be expected it is a shade-loving plant; too much shade, however, is said to reduce its flowering and fruiting. A temperature range of between 65°F. and 95°F. suits its requirements.

**Soils** Although in its natural habitat the plant thrives on red lateritic virgin soils, it can be grown on a wide range of soils, but heavy clays and poor sands are generally to be avoided. Free drainage and plenty of organic matter are necessary. It has not been possible to find any records of the range of pH values of suitable pepper soils, but the plant is known to respond to dressings of lime.



Propa-  
gation      Most authorities prefer to propagate pepper from cuttings rather than from seed. There are several ways of preparing the cuttings. In some areas, (e.g. Mysore in India) cuttings four to five feet long are used, gathered from runners which spring from the base of the plant. In Bombay such runners are layered, being lightly covered with compost or leaf-mould. The plants are severed when rooted at the nodes. A more common method is to take five-to-six-node cuttings from the basal runners and to set them with three nodes underground. In Ceylon it is more common to take terminal cuttings from the upper parts of one-and-a-half to two-year-old vines. These may be from 18 to 24 inches long and are set out straight in the field in their permanent sites. Although in Ceylon it is recommended that cuttings should not be taken from branches, yet in Sarawak prunings of seven nodes, specially prepared, are taken from any part of the vine apparently with equal success as long as they have a terminal bud.

When planting material is in short supply, single-node cuttings have been successfully used. These are sometimes called leaf cuttings and consist of leaf, petiole and bud attached to about two inches of stem. In Trinidad a simple method has been worked out which uses the same propagators as are used for striking cacao cuttings. This method uses Beta-indole-butyric acid, two mg. per ml. of 50% alcohol, employing a quick dip method. It is stated



that 75% of the cuttings are rooted in 21 days. After seven days hardening the plants are potted and are ready to be planted in their permanent positions three months later.

In Jamaica, two methods of propagation are used:

- (a) leaf cuttings; and
- (b) seven-node cuttings.

The latter method is also practised in Sarawak. It entails selecting terminal shoots, whether main or subsidiary, with ten leaves, nipping out the growing point, leaving the top three leaves and removing the next four leaves below these three. From ten days to a fortnight later the cutting with seven nodes is removed from the vine and set with the defoliated portion underground.

The seven-node cuttings are rooted in pots of light sandy soil with plenty of leaf-mould, either in I.C.T.A. propagators or in frames completely covered with plastic sheeting. It is necessary to take precautions against direct sunlight reaching the leaves and to maintain a high level of moisture both in the soil and in the surrounding air. No success has been obtained in Jamaica by setting the cuttings straight into the field where they are intended to grow

Single and two-node cuttings can be successfully rooted in containers set in pots under polythene sheeting



with the minimum of watering, provided the plastic sheet rests on the leaves and is tucked firmly around the block of cuttings to maintain maximum humidity. This is best done in a glasshouse, but good results have been obtained in a shade house.

Shade      In those pepper growing countries where shade is considered necessary, it is common practice to clear the jungle by cutting out undergrowth during the dry season and burning the dead material just before the advent of the rains. The trees that are left are used as supports for the pepper vines. In open cultivated land, however, it is necessary to supply the shade by planting live supports.

Whether or not shade is essential for black pepper, is a vexed question. In Indonesia black pepper is generally grown on artificial supports without shade, but in India and Ceylon the general consensus of opinion is that some shade is necessary. Local climatic conditions no doubt play a leading part in deciding whether to use shade or not. It has been observed that in India young pepper requires much shade, but that as the vines develop too much shade reduces flowering and fruiting. The necessity of preventing the roots from drying out in the open fields has led the Chinese to practise heavy mulching with cut grass.



Experience in Jamaica suggests that shade is necessary in the early years of a plantation, but when the pepper begins to bear the shade, can be more or less removed and reliance placed on the shade cast by the pepper vines on their supports in conjunction with mulching to keep the soil cool.

Supports                      The cultivation of pepper will require the provision of supports, either natural (live) or artificial.

For good live supports, plants should be selected which:

- (1) are quick growing;
- (2) have permanent rough bark;
- (3) will stand up to heavy pruning;
- (4) have deeply penetrating roots so as not to compete unduly with the pepper; and
- (5) are (preferably) leguminous species.

In Madras, the best plants for live support are as under, in order of priority:

- (1) *Erythrina indica*, (Indian Coral Tree)
- (2) *Garuga pinnata* (an Indian gum tree)
- (3) *Spondias mangifera* (Hog Plum)
- (4) *Mangifera indica* (Mango)
- (5) *Strychnos nux-vomica* (Nux-vomica)
- (6) *Caria arborea*, (an Indian gum tree).



Other trees like *Cola acuminata*, (Cola), *Terminalia* spp. (including Jordan Almond), *Pterocarpus marsupium*, (Gammalu), *Grevillea robusta*, (Silky Oak), etc., are also in use in India as supports for black pepper vines. In Malaya, in addition to *Erythrina* spp., *Ceiba pentandra*, (Silk Cotton), Jackfruit and *Morinda tinctoria*, (Indian Mulberry), are also used as supports.

In the West Indies the following trees have been tried:

- (1) *Crescentia cujete*, (Calabash)
- (2) *Gliricidia sepium*, (Quickstick)
- (3) *Erythrina* spp., (Coral Bean, Immortelle, etc.)
- (4) *Jatropha curcas*, (Physic Nut).

The best growth was obtained when using calabash; the mechanical advantage of using *Gliricidia* (in that it is easily established) was masked by the physiological effect of dense shade which needed constant lopping.

In Puerto Rico, *Casuarina* spp. (She-Oak, Willow), appears to be a promising shade tree for both vanilla and black pepper.

In Jamaica, the use of *Gliricidia sepium* (Quickstick) and *Inga vera* (Cocoa Wood) for support and shade has been advocated.



Artificial supports are in common use in Malaya and Indonesia. They are generally of selected hardwood and are expected to last the life of the plantation (15 years). Alternatively, where sound hardwood poles are not easily available, concrete posts have been used.

Planting Planting is usually done at the beginning of the rains. In Jamaica the choice of spring or autumn rains will depend upon which rains are the most dependable in the particular area. In many pepper growing countries it is sufficient to set several cuttings together in their permanent quarters. The bottom two or three nodes are set in the ground and dry trash is placed above. In Malabar as many as ten to twelve cuttings are set in a prepared hole on the north side of a tree and the hole is filled in with fine friable soil. In Sarawak, where jungle is cleared by fire, stakes are set out six feet apart and heaps made of ash and burnt soil are built around each stake and a cutting set in each mound, or heaps may be made against the trees on which it is desired to train the pepper vines. In Ceylon and Malaya rooting of the cuttings in nurseries is generally recommended. The plants rooted in pots are taken from the nursery and planted at the base of the trees or supports and tied in firmly. In Jamaica it has been found inadvisable to set unrooted cuttings in the field and all planting is carried out with rooted cuttings raised in nurseries.



Culti- On the Malabar Coast it is the practice to give  
vation a thorough forking at the beginning of the  
monsoon. At the end of the north-east monsoon a second  
light digging is given. It is recommended that on slop-  
ing land, cover or catch crops should be grown to protect  
the land and on steeper slopes narrow bench-terraces  
should be built for each row of plants. In Ceylon it is  
recommended that the soil should be kept free from weeds  
and at each time of weeding the earth should be drawn  
up towards the plants. In Sarawak, it is a common  
practice to apply burnt earth to the vine at the time of  
planting and thence after every four months.

Mounding It is a common practice to put fine soil round  
the base of each vine every year. This acts as a top-  
dressing and keeps the plant vigorous.

Mulching Black pepper being shallow-rooted responds to  
heavy mulching, with banana trash, dried grass, coir  
waste and other dead vegetable matter. Mulching is  
particularly important where black pepper is grown with  
the minimum of shade.

Manuring Availability of soil moisture is most important  
in pepper cultivation and in most countries  
means are taken to ensure moisture availability by  
increasing the organic matter in the soil. This is  
usually done by applications of cow-dung, household



refuse, compost, oilcake, fish manure, guano, etc. For instance, in Bombay it is recommended that to each vine should be applied  $\frac{1}{4}$  lb. fish guano, 1 lb. lime and 20 lb. compost.

Fertilizer Requirements      Not a great deal of factual information is available as to the fertilizer requirements of pepper. The Taliparamba Experiment Station has carried out trials over a period of ten years on limed and unlimed soils. As there was only one replication and the yields were extremely conflicting, no strict statistical interpretation could be given. However, all the limed plots gave better yields than the unlimed plots and conclusions were drawn that in the presence of lime, pepper responded well to applications of nitrogen plus phosphoric acid, nitrogen plus potash and potash plus phosphoric acid. Nitrogen alone gave the least response. Vines in all treatments also received each year a basket full of cattle manure or compost.

Experience from other countries is most conflicting. Fish manure which contains little or no potash also gives a good response. In Sarawak, prawn waste containing organic matter, phosphates and calcium salts is considered one of the best manures. In many places wood ashes or burnt earth are applied and the good



• results obtained may be accounted for by the presence of potash, but probably the availability of other salts and the raising of the pH value play a more important role.

As a general guide one cannot go far wrong in giving the vines heavy annual dressings of compost and lime, and following the general fertilizer recommendations for other crops which are grown on the particular soil on which it is intended to grow black pepper.

**Tying in the Vines** As the vines grow and branch they should be carefully and firmly tied into the supports. The tie should be made around a node so that the node is firmly pressed against the support and is enabled to send out clinger roots. Close attention should be given frequently to this operation as otherwise the continuous movement of the vine (such as might be caused by even light winds) will prevent it from climbing the support.

**Lowering** Some vines send up shoots without branches. It is a good practice to remove such runners from the standard. They can be cut right out, layered to produce more plants or coiled round in a circular basin at the foot of the vine leaving about a foot of the runner above ground.



Lowering is also used when establishing young plants to avoid having long vines without branches. When the vine has reached a height of about 30 inches, all but the top three or four leaves are removed and about ten days later the vine is taken down and wound round the base of the standard, all the defoliated portion being covered with fine soil. This will establish a good rooting system and many lateral branches will grow out.

**Pruning**        Methods of pruning pepper vary a great deal from country to country. In Ceylon some persons have suggested that if the vine is too bushy at the top, it should be thinned out and cut back. Others recommend that after a vine has started to bear, not more than three stems per vine should be allowed to remain and all new runners springing from the base should be cut out. Some experts on pepper culture recommend a continuous method of pruning in order to produce branching laterals and planting material at the same time as training the plant. Briefly, it consists in starting with a properly prepared plant raised from a seven-node cutting from which the lowest four leaves have been removed as well as the growing tip. This produces a plant with two growing shoots, one stronger than the other. When the stronger shoot has produced ten leaves the tip is pinched out, the three top leaves are left, the next four are removed and the



bottom three are left. From ten days to a fortnight later the prepared shoot is cut off below the seventh node and is used as a cutting. In the axils of one or two of the three leaves left after pruning new shoots will spring, which in due course will be treated in the same way. Meanwhile the second of the two original shoots will have developed ten leaves and will be treated and eventually cut off in the same way. There will soon come a time when the second shoot will fail to grow out sufficiently to produce ten leaves and it is then left to develop into a fruiting lateral. In this way the standard will become fully furnished with small fruiting laterals from ground level to the top.

#### Regulation of shade

The regulation of shade is a complicated problem but it has two objects in view:-

- (i) maintaining shade during the hot weather to keep the soil cool; and
- (ii) letting in sunlight during the cool weather to encourage the production of flowers and fruit.

For instance, on the Malabar Coast, shade is carefully regulated to prevent too much exposure to the direct rays of the sun. But in May, just before the monsoon rains, the branches of the *Erythrina* standards are lopped off to expose the vines to the sun and thereby encourage blossom and berry formation.



Harvest- The berries do not ripen all at once; the  
ing  
flowering season is spread over several months  
and the berries ripen about nine months later. The  
usual practice is to gather the berries when one or two  
in each spike have turned red. The method of harvesting  
depends upon whether black or white pepper is required.

White For the production of white pepper the berries  
Pepper  
are picked when turning red. They may be  
steeped in water from seven to ten days in order to  
decompose the pericarp. When the skins are loosened the  
berries are stamped by foot in running water and well  
washed until all skins and stalks are removed. The  
"corns" are then spread out for drying on mats.

Black For black pepper the berries are picked at a  
Pepper  
younger stage. They are sometimes heaped for a  
day or two in order to allow fermentation to take place  
and are then laid out in the sun to dry, when the flesh  
blackens and wrinkles over the seed. In Ceylon the  
berries are steeped in boiling water for ten minutes  
before being spread out in the sun to dry.

A picker can gather about 60 lb. green berries  
in a day, which on drying will give about 20 lb. dried  
pepper corn.

Varie- There is a great number of different varie-  
ties  
ties of pepper in the main pepper growing



countries. The variety being propagated by the Ministry of Agriculture and Lands in Jamaica is known as "Balamcotta" and was introduced from Trinidad in 1946 and again in 1954. In 1948 five varieties were introduced from the United States Department of Agriculture's crop Research Division in Maryland (9). They are:-

P.1	212962	Kudarvalli
P.1	212964	Kallivalli
P.1	212965	Balamcotta Kudravalli (Travancore)
P.1	213293	Karincotta, Karingota (Coorg)
P.1	213294	Kalbalamcotta

Pathology            In Asia black pepper is subject to attack by a number of insect pests and to one or two serious diseases. A disease commonly called "rootrot" is caused by a species of *Phytophthora* and possibly by other fungi. This trouble can be prevented to a certain extent by good cultural practices. However, no sure control is known. A "sudden death" disease has recently assumed serious importance in Sarawak and in other countries in the East and is likely to have very serious repercussions on the pepper trade. It is referred to by Christie as the "Yellow Disease" and is said to be caused by a burrowing nematode.

A number of weevils "hollow out" the berries and attacks by scale insects are general, but none of



these insects normally causes serious damage. They can be controlled by Derris Dust, D.D.T., or White Oil.

Snails may be troublesome at times attacking and killing newly planted vines. If this type of damage becomes serious it can be controlled by frequent application of bait made of bran and metaldehyde.

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This section is based on "A Review of Cultural Practices and their Application to Jamaica" by J.F. Ward.



IV. COST OF PRODUCTION

Current  
Cost of  
Produc-  
tion

Pepper comes from the dried berry (called a peppercorn) of a woody climbing vine. In general, it takes about 5 years before the vine comes into full production. The period during which the vine comes into full production, varies from region to region, depending upon climatic and soil conditions and methods of cultivation. In Kerala where pepper is largely grown in this country, the vine starts giving fruit between the 3rd and the 5th year and comes into full production around the 7th year.

The cost of cultivating and maintaining the vines for the first 6 years is estimated at Rs.1,695. The annual break-up of this level of expense is as follows:

Cost of Production - Pepper

<u>First Year</u>	<u>Rs</u>
Preparation of the ground	75.00
Pitting	40.00
Polls	40.00
Planting	40.00
2 weeding and digging	50.00
Total:	<u>245.00</u>



<u>Second Year</u>	<u>Rs.</u>
Cost of planting material 2000 vines at 6 paise per vine (5 vines per pole)	120.00
Pitting	40.00
Planting	30.00
Shading	40.00
Field care	30.00
2 weeding and digging	50.00
Total	<u>310.00</u>

<u>Third Year</u>	
Filling up the vacancies	15.00
Shading	40.00
Field care	30.00
Manuring	60.00
2 weeding and digging	50.00
Shade lopping	70.00
Pest and diseases	20.00
Total:	<u>285.00</u>

IV, V and VI Year - expenditure is the same as in the third year viz: Rs.285.00.

This estimate of expenditure has been worked out for a representative plantation of pepper which grows about 400 vines per acre. With the method of cultivation studied, the average yield per vine works out at 1.93 Kg.



The expenditure in the seventh year is estimated as follows:

a) Expenditure as observed in the sixth year. (The detailed break-up of which is given above)	Rs.285.00
b) Expenditure on gathering, drying and bagging:	Rs.550.00
	<hr/>
Total:	Rs.835.00
	<hr/>

The level of expenditure indicated above gives a yield per acre of about 770 Kgs. per annum. Valued at an average rate of Rs.3.40 per Kg., the average revenue per acre works out at Rs.2600/-.

The cost of production from seventh to fifteenth year is approximately the same as in the seventh year itself, unless the crop shows some abnormalcy, i.e., it is subjected to some disease, etc. The yield level also roughly remains the same, i.e., about Rs.2500/- per annum.

It has been indicated above that the initial cost during the first six years works out at Rs.1,695. If this amount is compounded for the rate of interest that will become chargeable year after year on the annual investment that will be made, the total base amount may be in the range of about Rs.3,000 assuming approximately a 10% rate of interest that may be



chargeable to the agriculturist. If an allowance is also made for the value of the land on which the vines are grown, the base block capital may be as large as Rs.4,500, the value of land generally being about Rs.1,500/- per acre.

If no allowance is made for the over-head expenses in the form of structures, buildings, tractors or other machine tools involved, a minimum return of Rs.450, i.e., about 10% of the initial block capital, may be considered desirable for the producer. Over and above this, the producer should recover from current earnings the current annual expenses involved in gathering, drying and bagging the pepper which works out at Rs.735 per acre. In all, therefore, the producer must recover Rs.1,185 as costs from the produce per acre. Following further expenses may be construed as cost to the producer:

a) Original cost:	Rs.1,185.00
b) 6 years' interest on the value of land (annuated yield):	Rs. 100.00
c) Land Tax:	Rs. 2.00
d) Agricultural income tax (average effective rate - about 8%):	Rs. 90.00
	<hr/>
	Rs.1,377.00



If we add to this level of cost, a 33% profit for the producer, the sale price for the producer should work out as follows:

a) Cost of Production	Rs. 1,377.00
b) Producer's profit:	Rs. 455.00
	<hr/>
	Rs. 1,832.00
	<hr/>

As against this level of cost, the producer currently gets about Rs. 2600 if he succeeds in selling his produce at the average rate of Rs. 3.40 per Kg. If the sale price per Kg. is less, the level of profit over and above what may be considered normal profits, will be low. In brief, the producer can, on the economics of present cultivation, sell at the rate of Rs. 2.40 per Kg. and still realise what may be considered as the normal profits.

It may be added that this level of cost of production is on the low side as compared to the average level of cost of production that may be observed in this country because the yield rate in the representative farms studied is on the high side. In any case, it is not difficult to conclude that if yield rate is increased to similar levels on all acreage under pepper, this may be the observed cost of production which may form the basis for our selling price after providing adequate margins for cleaning, processing and export



agents' commissions.

Cost of production in Indonesia      If the yield rates in the representative farms and the average yield rate observed in Indonesia are compared, they are roughly in the same region. Because of this reason, it is likely that some producers are able to produce pepper at a cost of production much lower than the average of 15 cents. As against this, in India this is about the lowest cost of production that may be experienced because of high yield rate in the representative farms studied. This difference in cost of production for Indonesia gives Indonesia the necessary edge over India in the international market and enables Indonesia to sell at much lower prices than India can afford to sell. But all the same, India can afford to sell at a price in the range of about 20 cents a pound, and at the same time, cover the cost of production for the more efficient units in pepper cultivation. However, it is for consideration whether at this low price some of the marginal units producing pepper will stay in business or will go out of it.

Future cost of production      At present the observed yield rate is a number of pepper producing districts is about 200 Kgs. per acre. This naturally suggests a high rate of cost of production which has all chances of being lowered to about 15 cents.



per lb. For this purpose, we will have to rely on the methods of production adopted in the high yielding representative firms studied above. This, in fact, should be our target cost of production per lb. if we have to stay competitive in the international market particularly against Indonesian production where yield rate per acre is very high and the likely cost of production is, after allowing for normal profits, not more than 15 cents. In fact, before allowing for profits, the cost of production per lb. may work out at no more than 11 cents.

Price  
determi-  
nation      In view of the details above, it is apparent  
that the cost of production of pepper is

likely to vary widely from plantation to plantation and the household to household depending upon the level of productivity per acre and the level of inputs used.

Since pepper is not an annual crop, the varying annual average cost of production also cannot be an important determinant of the current price level. The variable annual cost involved in maintaining the vines can only form the floor for determining the current price level, the actual price level being determined by the current levels of supply and demand. The average level of production over a few years will, however, be influenced by the average level of price that may come to be observed over 5 to 10 years period. In the short run, the cost of production is not likely to be an important factor in the determination of price.



## V. THE SIZE AND THE PATTERN OF EXPORTS

The size of exports      The level of exports of pepper from India has shown a gradual rising trend over the last few years. The annual average level of exports during the period 1951-56 was of the order of 13612 tonnes. The period 1951-56 corresponds to our First Five Year Plan. During the Second Five Year Plan, that is, during the period 1956-61, the annual average level of exports of pepper from India was of the order of 15686 tonnes. During the Third Plan, that is, 1961 to 1966, this average increased to 21022 tonnes. The average level of exports during 1966-68 has been observed to be 23,304 tonnes.

Over this period, the level of exports of pepper touched the peak of 26305 tonnes during the period 1965-66. The level of exports in 1967-68 has also been sizable being of the order of 24824 tonnes. The table below gives the annual level of exports during the period 1961-62 to 1967-68.

Table

<u>Year</u>	<u>Export (in Tonnes)</u>
1961-62	21620
1962-63	20868
1963-64	18935
1964-65	17387
1965-66	26305
1966-67	21785
1967-68	24824



The table below gives Zonewise exports of pepper for the period 1961-62 to 1967-68.

Zonewise Exports of Black Pepper  
from India - 1961-62 to 1967-68

(Quantity in tonnes)

Zones	1961- 62	1962- 63	1963- 64	1964- 65	1965- 66	1966- 67	1967- 68
U.K.	152	92	71	26	30	14	99
ECM coun- tries	2567	2226	1854	1855	2216	2110	2029
East Euro- pean coun- tries	6293	7156	9884	9403	12903	11210	18001
Other European Coun- tries	284	492	387	232	428	349	230
Middle East Zone	891	1445	1465	7757	1862	1273	649
East Asia Zone	975	1193	1211	1174	882	384	142
African Zone	187	358	492	550	869	993	1010
Austra- lia & Oceanic Zone	1	1	-	10	49	41	22
American Zone	10128	7900	3572	3347	7063	5411	2638
Other S.M.Val. Trans.	25	-	-	-	-	-	4
<b>Total Exports</b>	<b>21620</b>	<b>20868</b>	<b>18935</b>	<b>17387</b>	<b>26305</b>	<b>21785</b>	<b>24824</b>



The countrywise details of the volume of exports of pepper to different destinations from India over the period 1961-62 to 1967-68 are given in Annexure I.

The details of value of exports to different destinations from India over the period 1961-62 to 1967-68 are given in Annexure II.

It will be seen that though our exports of pepper have shown a gradual improvement in terms of quantity, we have not still achieved the annual average of earnings that was observed during the First Five Year Plan, that is, over the period 1951-56. The annual average earnings during 1951-56 were observed to be of the order of Rs.12.7 crores. This level of annual earnings declined to the level of about Rs.5.1 crores per annum during the period 1956-61 in spite of the fact that over the same period our exports in terms of volume increased. The level of earnings has since shown a gradual improvement and over the period 1961-66, the annual average earnings are estimated at about 7.8 crores. During the last two years, that is, 1966-68, the average annual level of earnings is estimated to be little over Rs.12 crores. The table below gives the annual level of earnings from exports of pepper during the period 1961-62 to 1967-68.



<u>Year</u>	<u>Annual Earnings</u> <u>(Rs. crores)</u>
1961-62	8.1
1962-63	6.6
1963-64	5.9
1964-65	6.8
1965-66	11.1
1966-67	11.8
1967-68	13.0

#### Trade Pattern

Whereas there has been a steady improvement in the level of exports over the last few years, there have been significant changes in the pattern of trade. Our exports to the Western Europe as also to the U.S.A. have declined substantially. As against this, our exports to the U.S.S.R. and the East Europe have shown a significant improvement. If we review the export statistics for the last seven years, that is, from 1961-62 to 1967-68, our exports to the U.K. have declined from 152 tonnes in 1961-62 to the low of 14 tonnes in 1966-67. In 1967-68, there has been a slight improvement, and imports from India into the U.K. have gone up to 99 tonnes. Over the same period, our exports to the U.S.A. declined from 8962 tonnes in 1961-62 to only 1330 tonnes in 1967-68. As against this, our exports to the U.S.S.R. have improved from the low of 2781 tonnes in 1961-62 to the high of 12570 tonnes in 1967-68.



The table below gives percentage shares by zones in total export earnings from exports of pepper.

Percentage shares of different zones in total  
Black Pepper Exports 1961-62 to 1967-68

Zone/ Countries	1961- 62	1962- 63	1963- 64	1964- 65	1965- 66	1966- 67	1967- 68
U.K.	0.8	0.4	0.3	0.2	0.1	0.1	0.3
ECM countries	12.8	11.1	10.1	10.7	8.9	10.4	8.4
East European Countries	30.2	35.2	53.4	54.6	49.5	49.7	72.3
Other European countries	1.2	2.3	2.1	1.3	1.7	1.7	1.0
Middle East Zone	4.2	7.0	7.6	4.4	6.7	5.3	2.5
East Asia Zone	4.2	5.1	5.5	5.5	2.7	1.4	0.5
African Zone	0.8	1.8	2.6	3.1	3.5	4.7	4.4
Australia & Oceanic Zone	-	-	-	0.1	0.1	0.2	0.1
American Zone	45.8	37.2	18.4	20.1	26.8	26.5	10.5
Total:	100.0	100.0	100.0	100.0	100.0	100.0	100.0

This table shows that the American Zone, largely, the U.S.A. and Canada which contributed about 46 per cent of our export earnings in 1961-62, contributed only 10.5 per cent in 1967-68. Over the same period, the contribution to our export earnings by the East European



countries went up from 30 per cent in 1961-62 to about 72 per cent in 1967-68. While export earnings from the African Zone have shown a gradual and steady increase, the exports to the East Asia Zone have been more recently declining.



## ANNEXURE - I

Statement showing countrywise (Zonewise) exports of Black Pepper from India during the financial years 1961-62, 1962-63, 1963-64, 1964-65, 1965-66 1966-67 and 1967-68

(in tonnes)

Countries	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68
<u>I. EUROPEAN ZONE</u>							
a) U.K.	152	92	71	26	30	14.0	99
b) E.C.M. <u>Countries:</u>							
France	253	334	50	137	11.2	87.4	3
Italy	1613	1786	1760	1670	2123.0	2003.2	1962
Netherlands	20	64	16	3	6.3	9.1	15
Germany West	677	41	28	45	70	10.7	49
Belgium	4	1	-	-	5	-	-
Total	2567	2226	1854	1855	2215.5	2110.4	2029
<u>c) EAST EUROPEAN COUNTRIES:</u>							
U.S.S.R.	2781	2962	5635	5000	8029	5263.3	12570
Czechoslovakia	455	814	810	706	1053.3	630.4	843
Yugoslavia	679	597	479	742	1182	1357.0	780
Poland	557	707	840	790	838	1040.2	1195
G.D.R.	582	1165	1295	920	480	701.7	588
Rumania	621	117	345	495	439.7	1312.0	1094
Bulgaria	123	277	100	235	100.5	205.3	375
Hungary	495	517	380	515	780	699.9	556
Total	6293	7156	9884	9403	12902.5	11209.8	18001



Countries	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68
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## d) OTHER EUROPEAN COUNTRIES:

Sweden	11	19	4	9	11.1	7.1	7
Norway	29	17	15	7	63	3.0	5
Denmark	23	14	20	9	11.1	2.0	2.5
Austria	-	-	(15 Kgs.)	-	-	-	-
Spain	147	-	156	126	152	166.2	-
Greece	56	126	117	58	113.5	25.9	155
Turkey	18	196	75	23	76	144.7	1
Iceland	-	-	-	-	-	-	59

Total:

284	492	387	232	427.3	348.9	230
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## II. MIDDLE EAST ZONE

Egypt (UAR)	312	838	768	275	919.4	245.5	355
Syria	-	3	-	-	4	-	-
Iraq	21	98	17	7	10.2	38.2	10
Iran	248	68	195	41	16.7	35.7	0.7
Jordan	3	2	-	0.5	-	-	-
Saudi Arabia	65	26	14	22	15.2	54.1	23
Aden	174	180	204	121	277	218.7	25
Bahrain Is.	10	16	21	14	22.5	24.6	1.8
Yemen	1	-	-	-	-	1.3	-
Libya	1	1	-	-	-	1.5	-
Ethiopia	12	19	26	-	0.5	26.8	2
Tokelau Is.	-	-	-	(19 Kgs.)	42.2	-	7
Somalia Rep.	-	-	-	-	25	-	-
Sudan	3	3	4	4	5	6.6	-
Kuwait	76	125	155	179	275	355.6	186
Q.T. Oman	41	48	47	78	71	218.7	20
	13	17	12	32	169	17.7	17



ANNEXURE-I CONTD.

Countries	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68
<u>MIDDLE EAST ZONE (CONTD.)</u>							
Muscat	1	1	2	2	0.3	1.0	0.9
Lebanon	-	-	-	0.2	15.2	27.3	-
Total	981	1445	1465	775.7	1862.2	1273.3	649

III. EAST ASIA ZONE

Nepal	-	-	-	-	1	4.7	85
Afghanistan	40	42	32	46	191	106.6	21
Pakistan East	127	259	156	194	51	-	-
Pakistan West	134	366	413	557	153	-	-
Ceylon	49	-	-	7	1.4	-	-
Burma	2	-	-	-	-	-	-
Hong Kong	-	0.1	(75 Kgs.)	0.1	-	(50 Kgs.)	(50 Kgs.)
Malaya Fedn.	18	-	-	-	-	44.3	2
Singapore	585	525	548	367	482	187.3	25
Philippines	-	-	44	-	-	-	-
Japan	20	1	18	3	2	41.2	9
Total	975	1193.1	1211	1174.1	881.4	384.1	142

IV. AFRICAN ZONE

Tanzania	-	-	-	-	-	8.3	1.2
Rhodesia	0.2	1	0.6	0.4	0.1	-	-
Kenya	36	28	25	5	14	5.5	3
Tanganyika	4	2	3	1.6	7	-	-
Zanzibar	1	3	3	1	1.6	-	-
Nigeria	-	0.1	0.4	0.6	0.1	0.2	(44 Kgs.)
Malawai	-	-	-	-	0.2	0.3	0.4



ANNEXURE-I CONTD.

A52

Countries	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68
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AFRICAN ZONE (CONTD.)

Zambia	-	-	-	-	0.3	0.4	(302 Kgs)
Mauritius	-	-	-	-	-	-	-
Mozambique	1	0.3	(20 Kgs)	-	-	-	-
Ghana	-	-	(50 Kgs)	0.3	-	-	-
Uganda	1	1	0.1	(4 Kgs.)	-	0.9	-
Seychelles	1	1	0.6	1	1.8	5.1	3
Honduras Br.	-	-	-	0.6	0.4	0.2	(75 Kgs)
Algeria	25	-	4	291	150	5.0	-
Morecco	118	21	6	90	93	599.9	800
Tunisia	-	298	450	149	600	67.0	5
Bel. Congo	-	3	-	-	-	300.0	200
Cameroons	-	-	-	-	-	-	-
(Other East African countries)	-	-	(28 Kgs)	(28 Kgs)	-	-	-
Total:	187.2	358.4	492.8	550.5	868.5	992.8	1010

V. AUSTRALIA AND OCEANIC ZONE

Australia	1	-	-	10	38.8	36.1	20
New Zealand	-	-	-	-	8.1	4.1	1.5
Fiji Is.	-	0.5	(65 Kgs)	0.1	1.6	0.3	(127 Kgs)
Total:	1	0.5	(65 Kgs)	10.1	48.5	40.5	22



ANNEXURE-I CONTD.

<u>Countries</u>	<u>1961-62</u>	<u>1962-63</u>	<u>1963-64</u>	<u>1964-65</u>	<u>1965-66</u>	<u>1966-67</u>	<u>1967-68</u>
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VI. AMERICAN ZONE

U.S.A.	8962	6470	2332	2289	5786	3815.4	1330
Canada	1128	1339	1179	1006	1235	1545.9	1292
Mexico	7	18	-	-	-	-	-
Guiana Br.	-	-	-	0.2	0.3	1.6	(100 Kgs)
Jamaica	2	-	4	1	4.1	-	-
Barbados	1	-	-	-	-	-	-
Trinidad	1	0.3	0.3	-	-	1.5	-
Haiti	24	64	46	45	31	30.1	13
Dominion Rep.	-	-	-	-	-	-	-
Bolivia	2	2	-	-	-	-	-
Guatemala	1	-	-	-	-	-	-
Nicaragua	-	4	-	1	-	-	-
Venezuela	-	3	-	-	-	14.5	2.5
Surinam	-	-	-	-	-	(10 Kgs)	-
Panama CZ	-	-	0.5	-	-	-	-
Other Pac. Is.	-	-	10	5	-	-	-
Windward Is.	-	-	-	-	5.3	2.0	-

Total: 10128 7900.3 3571.8 3347.2 7062.7 5411.0 2638

VII OTHER SM. VAL. TRANS.

25

4

Total exports  
from India:

21620 20868 18935 17381 26305.2 21785.0 24824



Statement showing countrywise (Zonewise) exports of Black Pepper from India during the financial years 1961-62, 1962-63, 1963-64, 1964-65, 1965-66, 1966-67 and 1967-68

Countries	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68
(in '000 Rs.)							
I. EUROPEAN ZONE							
(a) U.K.							
% over total exports	532	257	177	94	90.5	91.6	458
(b) ECM Countries							
France	917	998	134	488	16.7	418.4	7
Italy	6531	5947	5693	6601	9559.0	11770.4	10630
Netherlands	71	199	48	12	24.3	53.2	45.0
Germany West	2825	114	86	160	275	56.6	199.2
Belgium	12	3	-	-	21	-	-
Total:	10356	7261	5961	7261	9896.5	12298.6	10881
% over total exports	12.8%	11.1%	10.1%	10.7%	8.9%	10.4%	8.38%
(c) EAST EUROPEAN COUNTRIES							
U.S.S.R.	10270	9340	17876	20069	34140	25689.8	65462
Czechoslovakia	1893	2734	2596	2847	4557	3702.7	4481
Yugoslavia	2676	1914	1584	2754	5079	8060.7	4121
Poland	2026	2304	2701	2980	3576	5507.0	6192
G.D.R.	2316	3844	4039	3611	2097	3878.8	3049
Rumania	2587	397	1115	1895	1833	7061.6	5587
Bulgaria	486	893	320	920	432.4	1145.7	1978
Hungary	1948	1658	1231	2036	3370.5	3673.4	2946
Total:	24387	23084	31462	37112	55084.9	58719.7	93816
% over total exports	30.2%	35.1%	53.4%	54.6%	49.6%	49.7%	72.30%



ANNEXURE-II CONTD.

Countries	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68
<u>d) OTHER EUROPEAN COUNTRIES</u>							
Sweden	42	50	13	37	34.7	37.5	41
Norway	97	53	46	30	272	17.9	28
Denmark	77	35	60	30	43.6	12.0	13
Austria	-	-	(Rs. 65)	--	-	-	-
Spain	523	367	485	489	672.5	937.5	836
Greece	182	389	378	229	473	159.8	4
Turkey	66	623	243	96	339.2	861.0	349
Iceland	-	-	-	-	2.5	-	-
Total:	987	1517	1225	911	1838.1	2025.7	1251
% over total exports	1.2%	2.3%	2.1%	1.3%	1.7%	1.7%	0.96%

II. MIDDLE EAST ZONE

Egypt (UAR)	1096	2783	2378	1245	3848.0	1810.2	1816
Syria	-	8	-	-	13.0	-	-
Iraq	75	330	56	25	44.6	195.2	50
Iran	919	218	620	155	73.0	203.0	4
Jordan	10	6	-	11	-	-	-
Saudi Arabia	229	83	43	78	64.5	301.5	117
Aden	528	492	576	410	948.0	1032.3	99
Fahrain Is.	39	48	63	35	89	130.4	8
Yemen	5	-	-	-	-	6.6	-
Libya	4	4	-	-	-	7.7	11
Ethiopia	48	64	75	0.3	-	135.2	35
Tokelau Is.	-	-	-	-	163.6	-	-
Somalia Rep.	13	10	14	14	107.5	35.1	3.7
Sudan	249	377	457	596	18.6	1762.3	915
Kuwait	160	150	150	293	961.0	925.9	106



# ANNEXURE-II CONTD.

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Countries	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68
<b>MIDDLE EAST ZONE (CONTD)</b>							
Q.T. Oman	50	52	35	108	720	97.8	83
Muscat	4	5	6	9	1.9	5.9	4.5
Lebanon	-	-	-	1	63.4	168.1	-
Total:	3429	4630	4473	2980.3	7421.9	6317.2	3286
% over total exports	4.2%	7.0%	7.6%	4.4%	6.7%	5.3%	2.53%
<b>III. EAST ASIA ZONE</b>							
Nepal	-	-	-	-	-	-	-
Afghanistan	165	139	118	187	4.6	29.3	397
Pakistan East	633	968	570	787	847	547.8	114
Pakistan West	624	1249	1283	1812	225	-	-
Ceylon	208	-	-	62	582	-	-
Burma	7	-	-	11.6	-	-	-
Hong Kong	-	-	-	-	-	-	-
Malaya Fedn.	41	0.4	(Rs. 293)	0.5	-	(Rs. 244)	(Rs. 288)
Singapore	1585	976	1068	881	1288)	141.1	8
Philippines	-	-	143	-	-	728.0	76
Japan	34	4	58	10	9.3	237.8	47
Total:	3297	3336.4	3240.3	3739.5	2967.5	1684.0	642
% over total exports	4.1%	5.1%	5.5%	5.5%	2.7%	1.4%	0.49%



## ANNEXURE-II CONTD.

Countries	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68
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## IV. AFRICAN ZONE

Tanzania	-	-	-	-	-	45.7	6.1
Rhodesia	1	2	-	1.7	0.7	-	-
Kenya	122	76	16	16	58.6	28.2	17
Tanganyika	13	10	6	6	28.8	-	-
Zanzibar	5	8	2	2	6.5	-	-
Nigeria	-	2	5	5	0.4	1.4	(Rs. 330)
Malawi	-	-	-	-	1.0	2.0	1.4
Zambia	-	-	-	-	0.3	3.0	1.7
Mauritius	-	-	(Rs. 122)	-	-	-	-
Mozambique	3	1	(Rs. 176)	-	-	-	-
Ghana	-	0.8	(Rs. 15)	-	-	5.6	-
Uganda	2	-	3	3	7.4	28.0	17
Seychelles	3	2	3	3	2	0.8	(Rs. 378)
Honduras Br.	-	-	-	-	-	23.3	-
Algeria	101	12	1211	-	666.5	3382.5	4582
Morocco	375	19	377	-	393	395.7	27
Tunisia	-	1407	459	-	2697	1666.0	1111
Bel. Congo	-	-	-	-	-	-	-
Cameroons	-	(Rs. 120)	0.4	-	-	-	-
Tangier	-	-	42	-	-	-	-
Other East	-	-	-	-	-	-	-
African Countries	-	-	-	-	0.2	-	-
Total:	625	1203.4	1539.2	2121.1	3862.4	5582.2	5763
% over total exports	0.8%	1.8%	2.6%	3.1%	3.5%	4.7%	4.44%



## ANNEXURE-II CONTD.

Countries	1961-62	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68
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## V. AUSTRALIA &amp; OCEANIC ZONE

Australia	2	-	-	31	104.3	150.3	63
New Zealand	-	-	-	-	36.6	21.3	7.6
Fiji Is.	-	1	(Rs. 249)	0.3	8	2.3	(Rs. 920)
Total:	2	1	(Rs. 249)	31.3	148.9	173.9	71
% over total exports	..	..	..	0.05%	0.13%	0.14%	0.05%

## VI. AMERICAN ZONE

Switzerland	-	-	-	-	4.8	-	-
U.S.A.	32670	19975	6987	9702	24465	21627.9	7024
Canada	4149	4094	3624	3789	5065	9439.4	6508
Mexico	22	57	-	-	-	-	-
Guiana Br.	-	-	-	1	1.1	9.5	(Rs. 587)
Jamaica	9	-	14	4	18.2	-	-
Barbados	2	-	-	-	-	-	-
Trinidad	4	1	0.9	-	-	7.1	-
Haiti	99	223	150	177	135	178.9	65
Dominion Rep.	-	-	-	-	-	-	-
Bolivia	10	10	-	-	-	-	-
Guatemala	3	-	-	-	-	-	-
Nicaragua	-	19	-	3	-	-	-
Venezuela	-	8	-	-	-	91.7	14
Surinam	-	-	2	-	-	0.2	-
Panama CZ	-	-	32	-	-	-	-
Other Pacific Is.	-	-	-	11	-	-	-
Windward Is.	-	-	-	-	23.8	15.0	-
Total:	36968	24387	10809	13687	29712.9	31369.7	13612
% over total exports	45.8%	37.1%	18.4%	20.1%	26.8%	26.5%	10.5%
Total exports from							
India:	80770	65706	58887	67939	111022.1	118263.0	129778.0

Source: "Monthly Statistics of the Foreign Trade of India", Deptt. of Commercial Intelligence & Statistics, Calcutta.



## VI. THE STUDY OF MARKETS

U.S.A. & Canada      The rate of growth of the U.S.A's GNP shows no sign of abatement in 1967 or the first quarter of 1968. As it was, the \$20 billion rise in gross national production set a new record for a single quarter. It is true unusually large share of the first quarter advance - over two fifths - represented higher prices. The broad price index used to deflate GNP has accelerated since mid-1967 to a 4 per cent annual rate. During 1966 and early 1967, inflation had proceeded at a 3 per cent annual rate, while in the first half of the Sixties the price rise had been kept to an average of  $1\frac{1}{2}$  per cent a year. The current rate of price increase is more than the domestic American economy has historically been willing to tolerate for any protracted period. But this higher price though not very helpful to the economy has assisted spice demand since the unit value of spices purchased has also risen.

Again after allowance for inflation, however, the increase in real GNP in the first quarter was a substantial one. The 6 per cent annual rate of growth is among the best in recent years and nearly double the long-term growth rate.

Apart from the GNP rise, major upswing in consumer demand occurred in spending for non-durable



goods, principally food and clothing. It is also worth noting that the rise in incomes since late last year has been most pronounced among persons who tend to spend rather than save any additional income and who spend a particularly large share of their income on food, clothing and other necessities.

With the latest spending surge, the rise in personal outlays over the past year has virtually equalled the rise in disposable income. In other words, out of a \$39 billion rise in income after taxes, \$38.7 billion has been spent and less than 1 per cent added to savings. The consumer is no longer reluctant. He is spending freely from his enlarged income.

Growth Rate of Spice Expenditure      How is per capita demand likely to behave in the United States? There is a general impression that spice demand is inelastic

per capita, meaning demand rises with population and hardly anything else. Recent analysis of current consumption of blends has attracted attention to two new factors. In the first place, younger people in the United States are showing a marked preference for more interesting foods: they search for recipes which contain more spices and the pattern of their purchases has shown an increase in volume of packaged spices purchased and also a preference for blends which, like



barbecue spice, for example, are used in rather larger quantities than the sum of constituent spices mixed in the older households. Indeed, one of ASTA's releases stresses this new factor that barbecue spice "is used in larger amounts than would be the single spices if measured from 6 to 10 separate containers".

It is difficult to conclude how significant this trend will be in the very short period though it is certainly likely to show itself markedly in the next decade when the younger age-groups will spread their tastes into a majority of the population in the United States. The belief is entertained by those who have forecast this trend as scientifically as possible that an annual rate of growth of demand by 3.5 per cent is likely, of which roughly 2 per cent is attributable to population and 1.5 per cent to a genuine preference for more seasoned foods. It would be wise to assume no higher rate for the following quinquennium for both the U.S.A. and Canada.

The Canadian market, about a tenth of U.S. size, is broadly influenced by American purchase patterns and a strategy for the United States must be deemed to cover both countries. There is, of course, a Commonwealth preference for Indian against Indonesian pepper in Canada, and to this extent it will be easier to retain or expand the Indian pepper market there.



There is also somewhat more sentiment for Indian pepper as such in Canada but it would be unwise to lean too heavily on this factor which may have no long-period significance. At the current differential, both in Vancouver and Toronto, Indonesian (Lampong) pepper is being bought in preference to Malabar. It was stated in both centres that grinders or processors had no choice in view of current competition and imports from the United States.

Applying a common rate of growth of about 3.5 per cent both for the U.S. and the Canadian market, the likely demand level for pepper in 1971 has been estimated at about 25,000 tonnes as against the average of about 22,000 tonnes during the period 1961-66. The import level in these two countries during 1967 is observed to be much higher at 29,000 tonnes and is out of line with the general level of imports into these countries observed for a number of years in the past.

Detailed enquiries suggest that this is most likely due to building up of stocks in the United States largely induced by very low prices for Lampong pepper. In building up future estimates of imports into these countries we have, therefore, ignored the level of imports as observed in 1967 and have projected on the basis of the average observed during the years 1961-66.



This level of imports into these two countries accounts for just less than a third of the world level of imports estimated at about 85,000 tonnes for 1971. To share this level of market and share it in a big way is, therefore, to be an integral part of India's overall strategy for exports of pepper in the next few years. A recovery of the United States market of the order of about 6,000 tonnes by 1971 is proposed in the present study. This is a modest target when we compare it with the level of exports to the U.S.A. and Canada already achieved. Even in 1961-62, our level of exports to these countries was as high as about 10,000 tonnes. Of this just below 9,000 tonnes went to the U.S.A. and just over 1,000 tonnes to Canada.

Taking into account the change in population as also the change in the level of consumption of pepper, it is estimated that the U.S.S.R. alone will require by 1971 about 12,000 tonnes of pepper. The level of requirements of the U.S.S.R. may go up to about 15,000 tonnes by 1976. Briefly, the rate of growth in pepper import is estimated at about 10 per cent over the next 3 to 4 years and beyond that at about the rate of 6 per cent per annum.

Over the same period, the population in the U.S.S.R. is expected to go up from about 230 million in 1965 to about 250 million in 1976. But



it is not population, but greater affluence, which in this case will dominate the new consumption pattern. It has been observed that during the period 1954-58, the average per capita consumption of pepper in the U.S.S.R. was no more than 22 grams per person. The level of consumption has already risen to about 35 to 40 grams per person. In view of the relaxations on consumer expenditure in the U.S.S.R., it is most likely that the growth rate in per capita consumption of pepper will be higher than the growth rate observed during the last decade. It is estimated that by 1971 the per capita level of consumption of pepper in the U.S.S.R. will be about 50 grams per person and by 1976 the level of consumption per person will go up to about 60 grams.

The rate of growth of consumption of pepper in the U.S.S.R. raises at once the question of the extent to which pepper consumption is related to levels of income and affluence. Figures are attached showing estimated per capita consumption up to 1966 of pepper in leading countries of the world. There is no very precise correlation with income, but there is evidence of three large categories where income is the dominant component. In poor countries with per capita incomes under \$300 per annum, consumption tends to remain below 20 grams per capita. In medium countries with per capita incomes between \$300 - \$750 per annum,



consumption runs between 20 to 50 grams per capita. These societies seem to be entering the maturity stage before entering on mass consumption. Rich countries with incomes of over \$750 per head tend to stabilise consumption between 60 to 100 grams per head, but here no norms can be predicted since variations are large amongst countries of the same real income category. There is, however, a threshold of about 60 grams per head which applies to almost all. Undoubtedly, this will apply to all countries entering the top category.

Per Capita Consumption of Pepper in  
Selected Countries during 1954-58 &  
1964-66

Per Capita Consumption	<u>Consumption in Grams</u>	
	1954-58	1964-66
<u>Below 10 Grams</u>		
1. China	0.91	N.A.
2. Japan	3.18	13
<u>10 Grams to 25 Grams</u>		
3. Yugoslavia	10.43	N.A.
4. Iran	13.15	12
5. U.A.R.	19.50	31
6. U.S.S.R.	22.68	N.A.
7. Brazil	24.49	25
<u>26 Grams to 50 Grams</u>		
8. Peru	27.22	N.A.
9. Italy	31.75	47
10. India	34.02	9
11. Netherlands	35.38	51
12. Argentina	37.65	51
13. Greece	40.82	N.A.



Table Contd...

Per Capita Consumption	Consumption in Grams	
	1954-58	1964-66
<u>26 Grams to 50 Grams</u>		
14. Austria	45.34	60
15. France	49.90	65
16. Belgium	49.90	56
<u>51 Grams to 75 Grams</u>		
17. U.K.	57.61	51
18. Algeria	59.42	55
19. Germany	63.50	78
20. Denmark	67.58	88
21. Indonesia	72.57	N.A.
22. Australia	72.57	74
23. East Germany	N.A.	52
24. Hungary	N.A.	62
<u>Above 75 Grams</u>		
25. Canada	81.65	82
26. Sweden	83.46	60
27. U.S.A.	99.79	102
28. Czechoslovakia	N.A.	96

Taking into account both the change in population and increased per capita consumption of pepper, it is estimated that the U.S.S.R. alone will require by 1971 about 12,000 tonnes<sup>1/</sup> of pepper and 15,000 tonnes by 1976.

<sup>1/</sup> This estimate will appear to be a conservative estimate in view of the imports of the order of 12,570 tonnes of pepper by the U.S.S.R. in 1967-68. But imports at this level appear to be abnormal in the context of the historical perspective for imports into U.S.S.R. and an estimate at 12,000 tonnes for 1970-71 may be considered to be appropriate.



Briefly, the rate of growth in pepper imports is estimated at about 10 per cent over the next 3 to 4 years and beyond that at about the rate of 6 per cent over the next 3 to 4 years and beyond that at about the rate of 6 per cent per annum. This is a market which must be held though it provides India with no convertible currency. It is, in fact, a Market insurance against fears of over-production in the short period. It may even be necessary in years of increased demand while production has not yet caught up to negotiate other possibilities of supply. The U.S.S.R. market might, in special circumstances, be opened to Indonesian pepper provided a corresponding reduction in competition in the United States is ensured. This, however, is not intended to place on India any net obligation payable in foreign convertible currencies. It is merely a device to service the U.S.S.R. market when India's commitments to countries paying in convertible currencies preclude full supplies to the Soviet Union. Normally, an obligation to supply the U.S.S.R. would not exist, because bilateral trade is governed by the principle of additionality. But the U.S.S.R. market is far too important for it to be denied supplies on any account other than their con-availability in all areas within our reach of possible supply.



East Europe  
(other than  
the USSR)

East Europe is also becoming an important  
importer of Indian pepper. The maximum  
level of exports to different East

European countries observed during the last five years  
are as follows:

Country	Level of imports (tonnes)	Year
Czechoslovakia	1053	1965-66
Yugoslavia	1357	1966-67
Poland	1040	1966-67
East Germany	1295	1963-64
Rumania	1312	1966-67
Bulgaria	277	1962-63
Hungary	780	1965-66
Total:	7114	

The table suggests that in peak years, these countries imported over 7,000 tonnes of pepper though the average level of imports into these countries is observed at about 5,000 tonnes, per year during the period 1961-66. It is likely that these countries will demand by 1971 pepper equivalent to the level of peaks they have already reached during the past five or six years. If this happens, the total demand in the U.S.S.R. and the East Europe will be of the order of about 20,000 tonnes by 1971. It is estimated that the demand will



The price of black pepper alone has had a downward influence on the index of all spices and condiments except that more recently chillies prices are also having a downward influence on the index for all spices and condiments. The index for black pepper, as will be seen from the table, declined from 100 in 1952-53 as low as 20.5 in 1957-58. It showed a gradual improvement till 1960-61 when it touched 53.6. The index again declined to about 32 during the period 1962-64 when it picked up again and is keeping around 40 since then.

Relative Prices      The Table below gives the index of wholesale prices for all spices and condiments, all food articles and tobacco for the period 1953-54 to 1967-68 and also for January to June 1968.

Table

AVERAGE WHOLESALE PRICE INDEX FOR ALL SPICES , ALL FOOD ARTICLES AND TOBACCO (1953-54 to 1967-68 and JANUARY TO JUNE, 1968)

(1952-53=100)

Year	Index of wholesale prices		
	All Spices & Condiments	All Food Articles	Tobacco
1	2	3	4
1953-54	118.3	106.7	98.8
1954-55	114.3	94.6	90.1
1955-56	109.9	86.6	79.6
1956-57	97.4	102.3	82.8



Table Contd.

1	2	3	4
1957-58	96.4	106.5	92.4
1958-59	126.8	115.2	93.8
1959-60	151.7	119.0	97.9
1960-61	127.7	120.0	108.3
1961-62	140.2	120.1	96.8
1962-63	156.1	126.1	97.4
1963-64	158.4	136.8	116.8
1964-65	163.5	159.9	128.9
1965-66	181.2	168.8	134.2
1966-67	237.2	199.9	125.5
1967-68	244.7	242.2	130.2
<u>1968</u>			
January	244.0	238.2	133.4
February	240.0	233.1	138.1
March	239.2	226.5	147.7
April	246.7	233.8	155.2
May	243.3	234.5	161.1
June	257.9	237.1	162.1

It will be seen from this table that the index for all spices and condiments and for all food articles has been moving roughly in correspondence with one another. In individual years, however, there have been sharp



estimated that the demand for white pepper may be in the range of 85 to 90 per cent. But since white pepper is also the produce of the same vine as the black pepper, and the increased supply of one merely results in the corresponding reduced supply of the other, no separate supply and demand balance for the white pepper need be generated. However, it is likely that a large part of this increased demand will be met from sources currently producing white pepper, such as Sarawak and Brazil. If India is to share the increase in this market in an important way, it may be useful to diversify our pepper production so that some fraction of our total pepper production becomes available in the form of white pepper.

Western  
Europe  
other than  
the U.K.

The level of demand for pepper in the Western Europe is also likely to increase in the next few years though the rate of increase is not likely to be fast except in Italy and France where population is becoming increasingly pepper conscious. In France, the influence of Algerian population is noticed in the food habits of the local population. The Italian population is increasingly making use of pepper in its various foods, particularly Salami. In view of this, the per capita level of consumption in Italy has already moved up from under 32 grams per person during the period 1954-56 to about 47 grams per person in 1964-66. This level of per



capita consumption may go up to about 60 grams per person by about 1971.

A rate of growth of consumption of pepper in the Western Europe higher than the rate of growth of consumption in the U.S.A. is most likely: firstly; because the present level of per capita consumption of pepper in the Western Europe is about half the per capita consumption level of pepper in the U.S.A. Secondly; the rate of growth of national income in most of the West European economies is observed to be higher than the rate of growth of national income in the United States. As against the rate of growth of national income in the U.S.A. of 4.7 per cent during 1960-65, the rate of growth of national income in Italy, Germany, France and the Netherlands is observed to be respectively 4.8, 4.9, 5.1 and 5.0 per cent. In view of these tendencies for increased pepper consumption in Europe, an average rate of increase in consumption of pepper of about 3 per cent has been assumed. This assumed rate is slightly less than the rate of growth of pepper consumption assumed for the U.S.A. because the household retail consumption in Europe is observed to be largely stagnant and may act as a brake on the increase in pepper consumption that may come about via increase in demand of the institutional buyers.



Pepper Market in other countries      The level of demand for pepper in other countries in 1971 is estimated at 21,000 tonnes. This is about 3,000 tonnes more than the level of consumption observed in 1967 and only a little over 1000 tonnes above the consumption observed in 1965. This level of increase in demand for pepper is bound to come both on account of population factor as also on account of increase in national income that is taking place in these economies.

The Global Demand      Keeping in view the estimates presented in the paragraphs above, the global level of demand for pepper is estimated as follows:

<u>Year</u>	<u>Demand('000 tonnes)</u>
1965	76
1967	76
1971	86
1976	101

India's Share      This order of demand is estimated to be met as follows:

<u>Countries</u>	<u>1965</u>	<u>1967</u>	<u>1971</u>	<u>1976</u>
India	26	21	30	36
Indonesia	13	25	24	29
Sarawak, Malaya and Singapore	18	17	17	18
Brazil	8	8	10	12
Malagasy Republic )	2		2	3
Cambodia )	2	5	2	2
Ceylon )	1		1	1
<u>Total</u>	<u>70</u>	<u>76</u>	<u>86</u>	<u>101</u>



It will be seen that India is estimated to supply a little over third of the global demand for 1971 and a little over 35 per cent of the global demand in 1976.

The breakup of this level of exports from India by destination, is likely to be as shown in the table below:

Estimated Level of Exports by Zones

Geographical Zone	Level of Exports			
	1965-66	1967	1970-71	1975-76
U.S.A. & Canada	7.1	2.4	6.0	10.0
Europe	2.6	2.1	4.0	5.0
USSR & East Europe	12.9	13.8	16.0	16.0
Other countries	3.7	2.6	4.0	5.0
Total	26.2	20.9	30.0	36.0

If we study the exports of pepper from India for the last five years, it will be seen that we have exported in particular years substantial quantities of pepper to particular markets. If the humps observed in each country during the last five years are added up, the total exports of pepper from India amount to about 35,000 tonnes. The zonewise breakup of this level of export is given at page A75.



<u>Geographical Zone</u>	<u>Quantity in Tonnes</u>
USSR & East Europe	15144
Western Europe	3948
Middle East	2451
East Asia Zone	1598
African Zone	1074
Australian Zone	48
American Zone	10658
	<hr/>
Total	34921
	<hr/>

If India attempts to achieve the peak already observed in each of the countries in the last five years, we would more than cross the total export target fixed for 1970-71 and will be very close to the target fixed for 1975-76.



VII. PRICESDomestic Prices  
of Different  
Spices

Annexures I to VI give average monthly index of wholesale price in India for all spices and condiments - black

pepper, chillies, turmeric, cardamom and cumin for the period April 1953 to December 1967. The table below gives the annual average index (on financial year basis) for the period 1953-54 to 1967-68. This table also gives average monthly index of wholesale prices for these spices for January, February, March, April, May and June 1968.

TableAverage Wholesale Price Index for Different Spices

(1953-54 to 1967-68 and January to June 1968)

(1952-53=100)

Year	Index of wholesale prices					
	All Spices & Condiments	Black Pepper	Chillies	Turmeric	Carda- mom	Cumin
1953-54	118.3	78.4	193.3	126.6	86.3	120.9
1954-55	114.3	40.2	143.9	203.5	105.2	120.4
1955-56	109.9	34.5	109.4	238.3	116.6	97.8
1956-57	97.4	26.1	155.0	133.7	119.8	88.0
1957-58	96.4	20.5	147.7	66.6	123.6	144.5
1958-59	126.8	22.4	135.5	91.3	110.7	267.5
1959-60	151.7	35.5	185.8	132.6	115.7	263.0



Table Contd.

Year	Index of wholesale prices					
	All Spices & Con- diments	Black Pepper	Chillies	Turmeric	Cardamom	Cumin
1960-61	127.7	53.6	176.7	139.2	110.9	135.1
1961-62	140.2	40.0	176.7	163.5	93.3	140.2
1962-63	156.1	32.4	211.0	212.2	76.1	153.7
1963-64	158.4	32.8	200.9	202.4	75.4	187.8
1964-65	163.5	38.5	170.6	204.3	105.1	224.9
1965-66	181.2	42.6	189.0	153.7	198.8	263.5
1966-67	237.2	43.2	383.8	191.5	288.1	262.5
1967-68	244.7	40.6	279.2	330.6	256.5	300.0
<u>1968</u>						
Jan.	244.0	39.2	224.5	375.5	223.9	300.0
Feb.	240.0	39.4	189.8	385.5	235.5	300.0
March	239.2	38.8	173.4	396.3	225.5	300.0
April	246.7	38.9	157.1	438.9	233.0	300.0
May	243.3	39.9	151.8	398.3	234.7	299.7
June (2 weeks average)	257.9	39.0	147.4	403.7	257.7	300.0

It will be seen from this table that the index of all spices and condiments with 1952-53 as base, has been moving upward gradually till 1965-66 when it rose suddenly by 56 points in one year. The wholesale price

index has since stabilised itself at about the level of 240 points though has shown a sharp upward trend in June 1968.

The increase in the overall index for all spices and condiments has been contributed by the upward movement in prices of almost all spices other than pepper. It will be seen that the index for chillies went up with 1952-53 as base to 279 in 1967-68. The maximum index level reached was in the year 1966-67 which was a poor agricultural year in India. The price of chillies is at present coming down and the index has touched almost the low of 147 points which is about the lowest index level since 1957-58. But the upward movement in the index for all spices and condiments persists on account of a sharp increase in the price level for turmeric, the index of which currently stands at about 404 with 1952-53 as base. It will be seen that turmeric prices have shot up suddenly in 1967 on account of a short crop. The movement in the index for cardamom has also contributed to the increase in the index for all spices and condiments though recently the index for cardamom has been slightly lower than the index for all spices and condiments. The index for cumin has also been moving upward and is at present stabilised at the level of 300 with 1952-53 as 100.



The price of black pepper alone has had a downward influence on the index of all spices and condiments except that more recently chillies prices are also having a downward influence on the index for all spices and condiments. The index for black pepper, as will be seen from the table, declined from 100 in 1952-53 as low as 20.5 in 1957-58. It showed a gradual improvement till 1960-61 when it touched 53.6. The index again declined to about 32 during the period 1962-64 when it picked up again and is keeping around 40 since then.

Relative Prices      The Table below gives the index of wholesale prices for all spices and condiments, all food articles and tobacco for the period 1953-54 to 1967-68 and also for January to June 1968.

Table

AVERAGE WHOLESALE PRICE INDEX FOR ALL SPICES , ALL FOOD ARTICLES AND TOBACCO (1953-54 to 1967-68 and JANUARY TO JUNE, 1968)

(1952-53=100)

Year	Index of wholesale prices		
	All Spices & Condiments	All Food Articles	Tobacco
1	2	3	4
1953-54	118.3	106.7	98.8
1954-55	114.3	94.6	90.1
1955-56	109.9	86.6	79.6
1956-57	97.4	102.3	82.8

Table Contd.

1	2	3	4
1957-58	96.4	106.5	92.4
1958-59	126.8	115.2	93.8
1959-60	151.7	119.0	97.9
1960-61	127.7	120.0	108.3
1961-62	140.2	120.1	96.8
1962-63	156.1	126.1	97.4
1963-64	158.4	136.8	116.8
1964-65	163.5	159.9	128.9
1965-66	181.2	168.8	134.2
1966-67	237.2	199.9	125.5
1967-68	244.7	242.2	130.2
<u>1968</u>			
January	244.0	238.2	133.4
February	240.0	233.1	138.1
March	239.2	226.5	147.7
April	246.7	233.8	155.2
May	243.3	234.5	161.1
June	257.9	237.1	162.1

It will be seen from this table that the index for all spices and condiments and for all food articles has been moving roughly in correspondence with one another. In individual years, however, there have been sharp



differences. For example, in 1959-60, the index for spices was 152 as against 119 for all food articles. This difference corrected itself in the year 1960-61. A large difference in the two indices appeared again in 1962-63 which was corrected in the year 1964-65. In 1966-67 again a large difference between the price index for food articles and all spices arose which got corrected in 1967-68. A part of the explanation for the large difference between the index for spices and condiments and for all food articles for 1966-67 may be on account of the fact that whereas food was under rationing, the spices and condiments were not. As a result, the price for spices and condiments would have been taken from the free market whereas the price for food articles would not reflect the free market price for food since it will be weighted downwards for that portion of food which may have been distributed through the rationing agencies. It is certain that ecological factors will prevent any major shift of land devoted to spices and condiments towards other crops - food or non food. But all the same, it is likely that some marginal shifting of acreage takes place when the prices of spices and condiments move in different direction than the prices for all food articles or other non-food agricultural commodities. This is an area in which detailed research may yield good results and suggest as to



the extent to which acreage under different crops moves away from those commodities the prices for which decline and move in favour of those commodities the prices for which move up.

Some of the producers interviewed, particularly in Andhra Pradesh gave the impression that at times, turmeric and tobacco are substituted for one another depending upon the current price level. For this reason the index of wholesale prices for tobacco is also given in this table. However, it will be seen that the index for turmeric for almost all years has been higher than the index for tobacco showing that at least in the last few years there has been no scope for any shift of acreage from turmeric to tobacco. If at all any shift would have taken place, it would have been away from tobacco and for turmeric. More particularly, the index at present for turmeric is at 400 as against the index for tobacco at only 162 with the base 1952-53 as 100. Since turmeric production at present should be highly profitable proposition, it is likely that by next year, the production of turmeric will go up not only because of shifting of acreage from tobacco and other crops to turmeric. The indices of wholesale price for different spices would also suggest that if there was possibility of shifting land freely from one crop to another most of the area under pepper may have been transferred to



either other spices or other agricultural crops. This has not happened because pepper is a vine and is a long term crop with the average life of over 15 years. But if this imbalance in the price index between different spices as also between pepper and other agricultural crops persists, it may be that there is a gradual reduction in the acreage devoted to pepper. In that case, it will be necessary to increase the yield per acre both in order to meet the demand for pepper as also to make pepper growing an economically viable proposition not only in absolute terms but also relative to other crops.

It may, however, be added that the worsening terms of trade for any particular product vis-a-vis other products reflects either that the demand for that product is slackening vis-a-vis its supply position or its productivity is increasing causing a reduction in the cost of production and, therefore, in its price. Unfortunately, the prevailing factor so far has been the slackening of demand vis-a-vis the supply position which sharply increased because of Indonesian vines planted after the war going into production sometime in 1954-55 or earlier. But whatever causative factors for the worsening terms of trade for pepper, it will be best to remedy the situation by correspondingly reducing the cost of production which can only be done

by increasing the yield per unit of land devoted to pepper.

Actual Prices      The table below gives the actual market prices (wholesale) as reported from different markets.

These prices relate to the last week of May 1968.

Table  
Actual Wholesale Prices  
(Last week of May, 1968)

Spice	Centre	Unit	Price (in Rs.)
Black Pepper	Calcutta	Per Quintal	500.00
	Cochin	Per Quintal	342.50
	Madras	Per Quintal	370.00
Chillies	Calcutta	Per Quintal	210.00
	Patna	Per Quintal	210.00
11nd Quality	Madras	Per Quintal	160.00
Turmeric	Calcutta	Per Quintal	260.00
	Cochin	Per Quintal	325.00
Cumin	Calcutta	Per Kg.	5.25
Cardamom	Mangalore	Per Kg.	44.00
	Calcutta	Per Kg.	50.00



Export  
Prices

The table below gives the index for unit values realised from exports of pepper for the period 1953-54 to 1967-68 with 1952-53 as base.

Table

Index of Domestic and Export Prices of  
Black Pepper: 1953-54 to 1967-68

(1952-53=100)

Year	Index of Domestic Wholesale Price	Index of Export Price
1953-54	78.4	79.1
1954-55	40.2	39.1
1955-56	34.5	28.1
1956-57	26.1	22.7
1957-58	20.5	20.2
1958-59	22.4	12.2
1959-60	35.5	31.1
1960-61	53.6	38.8
1961-62	40.0	29.2
1962-63	32.4	24.8
1963-64	32.8	28.7
1964-65	38.5	30.8
1965-66	42.6	33.1
1966-67	43.2	40.9
1967-68	40.6	41.0

It will be seen from this table that the unit value has varied from maximum of 79 points in 1953-54 to the minimum of 12 points in 1958-59 indicating wide fluctuations in price levels for our exports of pepper. The index of unit value realization moved up to about 39 in 1960-61 but then started moving downwards. This downward tendency has been arrested from 1963-64 onwards, the year from which the U.S.S.R. and the East Europe have entered as major buyers of our black pepper. In fact, from that year onwards, the index has moved up and from about 25 in 1962-63 it has already touched 41 in 1967-68. It is expected that the index in regard to export price will stabilize itself at this level unless some understanding is reached with the other major suppliers of pepper like Indonesia and a price level higher than the current price level becomes possible.

The export price when compared with the domestic wholesale price of pepper shows a fair degree of correspondence though for individual years there have been differences in the levels for the two prices. For example, in 1958-59, the index for the domestic price level was over 22 whereas the index for the export price was just about 12. Sharp differences in the price index for domestic wholesale prices and for the export prices are also observed for the years 1960-61 and 1961-62. In more recent years, domestic price index is also stabilised at about 40.



ANNEXURE-IIndex Number of wholesale pricesSpices and Condiments

Month	1953	1954	1955	1956	1957	1958	1959	1960
January	-	127	105	106	94	101	136.8	168.3
February	-	120	109	105	93	96	141.6	140.3
March	-	188	110	105	89	93	137.5	131.5
April	102	124	110	105	88	97	141.6	129.7
May	110	122	112	105	89	102.1	143.7	129.2
June	118	116	113	102	89	111.7	144.8	127.9
July	120	116	115	97	97	125.7	147.5	130.3
August	118	112	115	96	99	128.3	149.6	130.0
September	120	117	113	97	98	130.0	153.1	129.9
October	118	118	112	97	101	131.8	161.2	129.4
November	121	113	107	97	102	139.9	167.2	129.8
December	127	110	106	97	104	139.7	172.0	126.3
Annual Average	117.1*	117.1	110.6	100.8	95.3	116.4	149.7	133.6

Month	1961	1962	1963	1964	1965	1966	1967
January	124.6	141.4	169.1	156.1	182.5	188.1	234.4
February	123.6	139.8	165.2	160.3	167.0	209.8	240.4
March	122.2	140.2	153.1	163.9	159.5	213.0	239.9
April	123.0	143.1	154.3	162.2	159.9	217.3	246.2
May	127.8	148.7	158.2	165.4	162.5	220.1	244.1
June	150-7	151.4	156.4	163.9	168.2	224-4	249.6
July	144.8	151.7	161.7	165.1	170.7	229.5	257.1
August	143.3	153.9	161.2	165.1	173.4	236.1	252.4
September	143.4	155.0	161.4	159.9	172.4	237.8	242.8
October	144.9	156.8	156.7	158.1	175.8	259.4	238.9
November	142.9	162.4	156.6	153.6	193.4	258.3	239.9
December	140.5	162.6	153.8	159.8	187.1	248.5	243.1
Annual Average	136.0	150.6	168.0	161.1	172.7	228.5	244.1

\*Average relates to 9 months only.



ANNEXURE-II

Index Number of wholesale prices  
Black Pepper  
 (1952-53 = 100)

Month	1953	1954	1955	1956	1957	1958	1959	1960
January	-	61	34	32	23	20	21.4	57.7
February	-	56	35	29	22	19	28.6	58.2
March	-	52	34	29	21	20	25.0	56.8
April	100	50	34	28	21	20.8	24.6	61.3
May	100	45	36	28	21	20.4	24.2	62.9
June	100	37	38	28	21	21.4	23.9	63.0
July	94	41	40	27	20	23.9	24.6	64.4
August	86	44	36	30	21	23.2	25.6	61.6
September	84	44	36	29	20	22.5	27.6	57.3
October	75	42	36	27	20	21.1	28.5	52.4
November	66	39	35	26	21	20.7	33.8	49.1
December	67	37	33	24	22	19.5	40.2	42.1
Annual Average	85.8*	45.7	35.6	28.1	21.1	21.0	27.3	57.2

Month	1961	1962	1963	1964	1965	1966	1967
January	44.3	34.5	30.6	31.2	42.7	41.3	41.3
February	42.8	32.8	30.7	31.5	40.4	40.8	39.9
March	42.4	34.7	31.0	33.6	40.2	41.1	40.0
April	42.1	33.8	32.2	36.8	41.1	41.6	41.0
May	42.0	33.4	33.2	37.8	41.9	47.7	42.0
June	43.9	33.3	38.4	38.7	41.4	42.6	43.0
July	46.5	32.2	33.5	37.9	43.3	45.8	42.9
August	45.4	32.1	31.8	37.2	45.7	48.3	40.7
September	41.1	33.0	32.2	36.7	45.0	46.5	39.8
October	39.9	33.7	34.8	37.4	43.9	44.3	40.8
November	37.4	33.5	34.4	37.0	43.7	43.2	40.5
December	36.3	31.4	31.2	39.5	42.3	42.7	39.2
Annual Average	42.3	33.2	32.4	36.3	42.6	43.3	40.9

\* Average relates to 9 months only.



ANNEXURE-III

Index Number of wholesale prices  
CHILLIES

(1952-53=100)

Month	1953	1954	1955	1956	1957	1958	1959	1960
January	-	218	103	113	167	133	157.9	227.2
February	-	189	109	121	164	117	148.0	191.7
March	-	177	113	127	154	113	135.2	176.1
April	113	204	113	136	154	109.3	146.5	173.5
May	144	195	109	141	155	105.7	154.2	179.4
June	168	180	107	148	156	113.6	161.8	184.7
July	190	171	110	151	159	124.0	166.2	190.3
August	213	149	107	147	163	130.2	171.1	193.3
September	213	139	102	152	157	134.9	179.9	195.2
October	223	137	99	158	159	147.6	202.0	196.3
November	236	124	100	168	156	157.1	217.1	188.9
December	235	103	105	174	150	163.0	235.7	175.8
Annual Average	192.8*	165.5	106.4	144.7	157.8	129.0	173.0	189.4

Month	1961	1962	1963	1964	1965	1966	1967
January	148.9	180.4	274.7	187.4	166.0	209.7	355.8
February	146.9	175.0	258.7	182.3	157.3	214.5	373.5
March	147.0	168.2	201.7	172.5	154.0	222.1	360.0
April	152.0	166.2	205.3	174.4	159.2	232.4	361.3
May	173.3	166.1	204.0	183.3	159.8	261.6	344.4
June	177.7	173.8	212.2	181.7	160.3	321.8	335.2
July	187.0	181.1	212.5	185.5	171.7	380.3	336.4
August	187.8	197.8	218.1	183.0	184.2	408.9	314.0
September	186.9	206.1	212.5	170.2	181.7	432.4	286.4
October	172.3	218-2	206.3	169.1	180.3	510.5	279.4
November	177.1	240.8	204.9	166.7	214.9	504.2	268.9
December	182.5	246.9	192.4	156.5	209.4	463.8	237.1
Annual Average	170.0	193.4	216-7	176.1	174.9	346.9	321.0

\* Average relates to 9 months only.



ANNEXURE-IV

Index Number of wholesale prices  
TURMERIC

(1952-53=100)

Month	1953	1954	1955	1956	1957	1958	1959	1960
January	-	151	213	232	98	74	88.9	149.6
February	-	145	246	220	96	63	119.2	144.5
March	-	150	249	206	84	62	107.2	135.3
April	91	172	251	191	79	75.5	113.4	131.9
May	90	185	251	187	76	75.5	115.1	129.0
June	102	180	246	167	66	85.0	113.5	130.8
July	110	180	241	139	63	91.5	114.2	136.3
August	118	178	240	137	62	-	120.1	135.4
September	135	197	247	136	59	-	125.8	131.8
October	137	211	245	132	58	-	155.1	130.0
November	137	212	244	122	62	-	153.8	140.0
December	153	219	236	115	75	87.7	150.8	144.7
Annual Average	119.2*	181.7	242.4	165.3	73.2	76.8	123.1	136.6

Month	1961	1962	1963	1964	1965	1966	1967
January	155.7	169.8	224.1	191.8	275.0	124.9	191.2
February	155.4	169.2	226.8	215.2	225.6	196.0	201.2
March	146.7	178.2	209.5	217.5	161.3	170.2	209.5
April	140.7	191.3	209.6	200.1	168.7	186.5	224.5
May	140.3	215.6	233.7	209.3	166.3	188.4	233.1
June	145.0	215.6	208.2	198.0	154.0	183.4	269.6
July	163.1	215.6	208.1	201.2	149.7	180.2	328.6
August	166.9	210.9	198.0	205.3	149.6	184.7	338.4
September	165.1	205.1	200.7	205.0	146.7	182.1	345.2
October	177.9	202.8	172.3	195.5	152.2	185.3	346.8
November	176.2	214.3	171.3	186.5	144.6	208.0	360.5
December	169.4	214.5	-	188.5	121.1	197.8	366.1
Annual Average	158.5	200.2	205.7	201.2	167.9	182.3	284.6

\* Average relates to 9 months only.



ANNEXURE-V

Index Number of wholesale prices  
CARDAMOM

(1952-53=100)

Month	1953	1954	1955	1956	1957	1958	1959	1960
January	-	106	98	108	125	116	106.7	117.3
February	-	131	99	108	130	115	106.9	117.0
March	-	129	97	115	127	114	110.0	115.2
April	69	126	104	122	127	114.3	113.1	120.5
May	70	116	112	121	131	112.4	114.3	119.2
June	70	111	121	119	132	110.7	112.6	115.8
July	70	114	131	112	122	110.8	115.5	116.2
August	70	108	136	110	127	111.8	114.5	112.1
September	71	98	123	115	120	114.0	116.8	116.3
October	75	101	122	118	129	112.3	116.9	115.0
November	78	95	110	116	129	112.0	117.8	111.6
December	96	99	109	122	121	106.9	117.8	104.0
Annual Average	74.3*	111.2	113.5	115.5	126.7	112.5	113.6	115.0

Month	1961	1962	1963	1964	1965	1966	1967
January	101.5	88.3	78.5	75.7	159.9	212.5	284.0
February	99.6	82.0	67.9	74.2	159.9	290.5	292.7
March	98.4	79.5	69.7	73.3	164.5	313.8	289.0
April	98.9	78.4	71.8	75.2	164.5	301.9	292.5
May	99.7	78.2	71.8	75.6	164.5	277.8	284.0
June	99.4	77.6	74.7	78.6	164.5	274.7	289.0
July	97.2	74.7	76.1	79.3	170.7	296.4	293.9
August	95.0	74.7	75.5	78.1	172.3	296.4	282.1
September	95.1	79.0	76.6	77.3	172.3	284.0	250.5
October	95.2	79.5	76.3	81.2	172.3	293.9	234.2
November	95.9	78.9	78.3	94.5	181.6	289.0	234.1
December	93.4	76.1	80.3	137.5	206.4	227.6	232.4
Annual Average	97.4	78.9	74.8	83.4	171.1	284.0	271.5

\* Average relates to 9 months only.



ANNEXURE-VIIndex Number of wholesale prices  
CUMIN (JIRA)

(1952-53=100)

Month	1953	1954	1955	1956	1957	1958	1959	1960
January	-	138	119	89	88	172	291.3	263.7
February	-	117	101	89	88	172	291.3	136.1
March	-	121	101	88	88	157	291.3	130.3
April	100	117	100	88	88	157.1	291.3	130.3
May	111	115	100	88	88	187.8	291.3	130.3
June	121	115	104	88	98	223.3	291.3	130.3
July	126	114	104	88	142	283.6	293.2	130.3
August	115	118	106	88	146	291.3	291.3	133.4
September	115	138	106	88	157	291.3	291.3	139.0
October	127	138	106	88	165	299.0	291.3	139.4
November	130	134	93	88	173	303.1	291.3	137.7
December	130	135	89	88	176	299.0	293.2	137.5
Annual Average	119.4*	125.0	102.4	88.2	124.8	236.4	291.6	144.9

Month	1961	1962	1963	1964	1965	1966	1967
January	137.7	146.9	153.1	196.6	219.4	248.6	285.7
February	137.7	146.9	153.1	204.9	219.4	230.1	281.4
March	137.7	148.1	153.1	233.1	219.4	237.1	283.6
April	137.7	156.0	153.1	233.1	219.4	237.1	300.0
May	137.7	155.9	153.1	233.1	230.6	235.4	300.0
June	137.7	154.3	156.2	233.1	285.7	235.4	300.0
July	137.7	153.1	183.7	233.1	285.7	244.0	300.0
August	139.3	153.1	190.1	233.1	285.7	255.3	300.0
September	137.7	153.1	192.7	216.3	285.7	257.1	300.0
October	137.7	153.1	196.6	219.4	285.7	274.3	300.0
November	137.7	153.1	196.6	219.4	285.7	275.0	300.0
December	136.9	153.1	196.6	219.4	282.3	185.7	300.0
Annual Average	137.8	152.2	173.2	222.9	250.7	251.3	295.9

\* Average relates to 9 months only.



### VIII. TAXATION

Pepper export trade apart from local taxes, is subject to two types of taxes - Central and State Taxes.

Central Taxes      Central taxes will include Income Tax,

Corporation Tax and Custom duties. The personal income tax is levied on all personal incomes and no discrimination is made in favour of personal incomes earned from export trade.

Corporate Taxes      The export earnings from several commodities

were subject to a number of reliefs before devaluation. These reliefs, however, have now been abolished to a large degree. It is for consideration whether a relief in corporate tax can be incorporated for export earnings from pepper particularly from convertible areas. The export earnings from convertible areas result in realisations of free foreign exchange and the community may be prepared to bear some cost for earning such foreign exchange. The technical details of such a proposal, however, may not be discussed here though such a relief is considered desirable.

Custom  
Duties

Pepper exports are subject to export duties as follows:

Export Duties on Pepper

<u>Black Pepper</u>	<u>Duty</u>
a) Light Pepper	90 paise per kg.
b) Pin-head Pepper	50 paise per kg.
c) Other	Rs.1.25 per kg.

Plus a cess of  $\frac{1}{2}\%$  ad valorem on the Tariff value fixed by the Government (Currently Rs.302 per quintal).

The Marketing Research Corporation of India has, after detailed investigations, arrived at the conclusion that there is no case for reduction in these duties except in the case of pinheads.

State  
Taxes

State levies a number of taxes which directly or indirectly impinge upon the cost of production of pepper.

Land  
Taxes

The Kerala State levies a basic land tax of Rs.2 per acre on all lands. This goes into the basic cost of production of pepper.

Sales  
Tax

In addition a sales tax of 5% is levied on all sales of pepper even if these are intended for export.

The exporter gets no rebate for this amount paid to the State.



Since most of the trading is done on trade margins, every tax levied at an initial purchase has a pyramiding effect on subsequent sales. For example, if a 5% tax is paid to the producer by the wholesaler and the wholesaler is working on a 10% margin, when he makes sale to the exporter, then the real incidence of the initial 5% tax will work out to be much higher. Since exporter again is likely to work on margin, the pyramiding effect will be multiplied by the time the commodity is in fact exported.

Agricul- The Government of India Act of 1935 provided  
tural  
Income for the taxation of agricultural incomes by  
Tax the provincial governments. Under this Act,  
the Kerala State has levied an agricultural income tax.  
This tax applies to income from production of pepper  
also.

Article 366 of the Constitution of India specifies that agricultural income for the purposes of tax shall mean agricultural income as defined under the Income-Tax Act. This income is computed after netting it for payments made on account of land revenue, rent, local rates, cesses, maintenance of capital assets and other irrigational works, all expenses incurred in respect of cultivation, harvesting, thrashing, transporting and marketing of the agricultural

produce, payments made towards crop insurance and all taxes and cesses paid on sale of crops. Besides this, a depreciation allowance is allowed on capital assets.

The rates of agricultural income tax in the three States in which pepper is largely grown, are as follows:

Rates of Agricultural Income-Tax

(Percent)

	Kerala	Madras	Mysore
Exemption limit (Rs.)	3000	3600	3500
<u>Taxable Slab</u>			
On the first Rs.1500	-	-	-
On the next Rs.3500	5	5	3
On the next Rs.5000	11	15	6
On the next Rs.5000	18	20	9
On the next Rs.5000	25	25	12
On the next Rs.5000	25	30	15
On the next Rs.10000	25	45	18
On the next Rs.15000	25	45	21
On the next Rs.50000	25	45	21
On the balance	25	45	40

Notes:

1. The agricultural income-tax shall in no case exceed half the amount by which the total agricultural income exceeds a specified limit.



2. Special Exemption limit in case of a Hindu Undivided Family.

- i) Mysore - Rs.7000      ii) Kerala - Rs.6000

3. In case of a Company:

- i) Madras: On the whole of the total agricultural income, the tax shall be payable at the rate of 45 N.P. in the rupee.
- ii) Kerala: On the whole of the total agricultural income, the tax shall be payable at the maximum rate.

4. General:

- i) Mysore: a) The Act distinguishes between earned and unearned incomes.
- b) In case of non-residents, the total agricultural income is chargeable to agricultural income tax.
- ii) Madras: a) The non-agricultural income is also taken into account and the agricultural portion is assessed at the higher rates applicable to total income.
- b) Madras also provides for compounding of agricultural income tax at the following rates:

Extent	Rate for standard acre (Rs.)	Remarks
On the first 12½ Standard acres	Nil	Persons holding land not exceeding 4 times the exempted extent alone can apply for permission to compound the agricultural income-tax.
On the next 7½ Standard acres	4.50	
On the next 10 Standard acres	7.50	
On the next 10 Standard acres	10.00	
On the next 10 Standard acres	15.00	



A pre-requisite to an efficient assessment of agricultural income is a systematic maintenance of farm accounts. The maintenance of such accounts by a multitude of Indian farmers is very difficult. Apart from that, provision for this level of taxation forms an essential ingredient of cost of selling by the producer. This, therefore, raises the cost of pepper to the exporter.

The above survey of State tax system shows that Indian pepper produce is subject to a number of levies of different orders and at different stages. In addition, a number of levies like octroi, tolls, entry taxes, municipal taxes, weighment tax, etc., are collected by the local authorities. The total incidence of these levies is likely to be large. The rough estimates suggest that this may be of the order of about 20% of the sale proceeds of the producer considering that the producer is of an average standard with an annual income of about Rs. 10,000. In order to make our pepper competitive in the world market, it is, therefore, necessary that this level of taxation - State and local - should be so adjusted that this is borne by the exporter only to the extent that his competitive position in the world market warrants. Also the procedures of taxation should be simplified so that the total revenue yield from all State taxes combined is secured by a single tax



in the nature of a cess. This will relieve the producer from maintaining detailed farm accounts, as also the State from maintaining multiple agencies to check evasion of taxes at various stages of levy. The procedure of adjusting the incidence of this tax on exports will also be simple. If the exports can bear the entire cess and still remain competitive in the world market, no relief from cess need be given to the exporters. But in case world prices fall below the price level at which Indian pepper is available for exports, then the cess may be reduced by a fixed percentage so that the reduction in the incidence of taxation makes Indian pepper competitive in the world markets.

Taxation Abroad: Indonesia	The level of taxation of production or sale of pepper in Indonesia is not known,
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but since the exports of pepper from Indonesia are heavily subsidised, it would appear that production or export of pepper in Indonesia would be largely free of taxation. The Indonesian exporter of pepper gets an export certificate of the order of 75% of the value of exports. This export certificate is saleable in the market at the going market price for foreign exchange. A conservative estimate will be that the free market price of foreign exchange in Indonesia is about 50% higher than the official par value. If this is so,

A100

then the price realisation by an Indonesian exporter will work out at about 37 cents per lb. when his actual foreign exchange realisations are only 27 cents per lb. It is interesting to note that this is about the same price which is realised by Indian exporters on exports of pepper.

Malaysia Another important exporter of spices is

Malaysia. Malaysia also levies export duty on exports of white and black pepper. The rates of duty are as follows:

Export Duties - Malaysia (Sarawak & Sabah)  
(in \$)

Duty	White Pepper	Black Pepper
Nil on the first		
Plus 5% ad valorem on the next	55 per picul <sup>1/</sup>	40 per picul <sup>2/</sup>
Plus 10-45% ad valorem on the next	70 per picul	50 per picul
Plus 50% ad valorem on the next	40 per picul	24 per picul
Plus 15% ad valorem on the next	10 per picul	5 per picul
Plus 50% ad valorem on the balance	90 per picul	65 per picul

<sup>1/</sup> rising by 5% on each additional \$5

<sup>2/</sup> rising by 5% on each additional \$3

Note: The value on which the duty will be based will be the Singapore price less 12 per cent.



Ceylon Ceylon, which also exports pepper does not levy any export duty.

Import Duties The imports of pepper in a large number of countries are subject to import duties. The level of import duties that exist in different countries are given in Annexure-I. It will be seen that taxes on import of pepper in EEC countries are very high, maximum being 39% ad valorem on ground pepper in Italy. Varying rates of tax are levied in other countries also. It will be desirable if in keeping with the general practice of lowering tariffs all over the world particularly in the advanced countries for commodities coming from under-developed parts of the world, the import duties on pepper, at least unground pepper, are either substantially lowered or abolished altogether. In this matter, GATT or UNCTAD may be got interested and this subject may be taken up with them for favour of removal of all import duties at least on whole pepper in different countries, particularly the advanced countries.

LEVEL OF IMPORT DUTIES IN DIFFERENT COUNTRIES1. AUSTRALIA

	<u>General Duty</u>	<u>Preferential (Common-wealth Rate)</u>
a) Unground Pepper	10% ad valorem	Free
b) Ground Pepper	A\$0.33 per lb.	A\$0.25 per lb.
Plus primage duty* 10% ad valorem 5% ad valorem		

\*Payable on ground pepper not used for the manufacture of essential oil.

2. CANADA

	<u>General</u>	<u>Most favour- ed Nation</u>	<u>British Preferential</u>
Unground Pepper	12½%	5%	Free

3. E.E.C. COUNTRIESA. BENELUX

	<u>General Rate</u>	<u>E.E.C. Rate</u>
a) Not crushed or ground	17% ad valorem	Free (Greece 16.5%)
b) Crushed or ground	21% ad valorem	3.7% ad valorem

Plus TaxesLUXEMBOURG

Import Tax of 3%  
duty paid value

BELGIUM

Transmission  
tax of 23%  
of duty paid  
value

NETHERLANDS

Turnover tax  
of 6/94 of duty  
paid value



ANNEXURE-I CONTD.B. FRANCE

	<u>General Rate</u>	<u>E.E.C. Rate</u>
a) Not crushed or ground	17% ad valorem	Free (Greece 17%)
b) Crushed or ground	27% ad valorem	7.5% (Greece 27%)

Plus Tax on value added (T.V.A.) of 25% of duty paid value.

C. ITALY

	<u>General Rate</u>	<u>E.E.C. Rate</u>
a) Unground Pepper	17% ad valorem	Free
b) Ground Pepper	39% ad valorem	15% ad valorem
	Minimum duty 195 lire/kg.net	Minimum duty 25 lire/kg.net
	Maximum duty 313 lire/kg.net	Maximum duty 75 lire/kg.net

Plus Administration fee of about 1% of c.i.f. value

Plus Turnover tax (I.G.E.) of 16.8% of grosss landed value.

D. WEST GERMANY

	<u>General Rate</u>	<u>E.E.C. Rate</u>
a) Unground Pepper	17% ad valorem	Free
b) Ground Pepper	25% ad valorem	8.7 (Algeria 12.2%)
c) Unground intended for manufacture of essential oils.	Free	Free

Plus Value-added tax (T.V.A.) of 4% on duty paid value.

4. E.F.T.A. COUNTRIESA. AUSTRIA

	<u>General Rate</u>	<u>T.A.T.T. Rate</u>	<u>EFTA RATE</u>
a) Unground Pepper	1,800 sch./ 100 kg.	1,750 sch./ 100 kg.	Free
b) Ground or crushed pepper	2,700 sch./ 100 kg.	2,700 sch./ 100 kg.	Free

Plus Turnover Equalisation Tax of 5.25% on duty paid value.

ANNEXURE-I CONTD.B. DENMARK

	<u>General Rate</u>	<u>E.F.T.A. Rate</u>
a) Pepper for retail sale	5% ad valorem	Free
b) Other pepper	Free	Free

Plus Added value tax of 7% of duty paid value.

C. NORWAY

No duty is payable on imports of pepper but a sales tax of 13.64% (equal to 12% of the final price) is payable at the final point of retail.

D. PORTUGAL

	<u>General Rate</u>	<u>Portuguese Overseas Provinces</u>
Pepper	20 paper escudos per kg.	6 paper escudos per kg.

E. SWEDEN

Imports of pepper are duty-free, but a sales tax of 11.11% (equivalent to 10% of the price paid by the consumer) is payable at the final point of retail.

F. SWITZERLAND

	<u>General Rate</u>	<u>E.F.T.A. Rate</u>
a) Unprocessed pepper	30 fr. per kg. gross	Free
b) Processed pepper	60 fr. per kg. gross	Free

Plus a statistical tax of 3% of Customs charges, minimum 10 centimes per customs declaration.



ANNEXURE-I CONTD.G. UNITED KINGDOM

	<u>Full Rate</u>	<u>Commonwealth E.F.T.A. Rate Preference</u>	
a) Unground	4/6d. per cwt.	Free	4/6d. per cwt.
b) Ground	10% ad valorem	Free	10% ad valorem

5. JAPAN

	<u>General Rate</u>
a) Pepper for retail sale	25% ad valorem
b) Other pepper	
1) Ground or mixed	15% ad valorem
2) Unground	5% ad valorem

6. UNITED STATES

	<u>General Rate</u>
a) Unground pepper	Free
b) Ground pepper	1½ cents per lb.

7. UNION OF SOUTH AFRICA

	<u>General Rate</u>	<u>Most Favoured Nation Rate</u>
a) Unground pepper	21 cents per 100 lb.	Free
b) Ground pepper	185 cents per 100 lb.	185 cents per 100 lb.

Import licences are required.

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Source: Plantation Crops, No.11

## APPENDIX ON OLEORESINS

Oleoresin of Pepper is so much the most important of all oleoresins that this seems the most appropriate place to describe the new technological advances which have been made in the last decade, almost exclusively in the United States, with oleoresins, superesins\*, bakeresins\* and viandoresins\*.

### THE USE OF OLEORESINS

An Oleoresin is prepared from a spice or herb by extraction with a selected volatile, organic solvent after which the extracting medium is completely removed under vacuum for permissible residual solvents.

Oleoresins, therefore, differ from the corresponding essential oil in that a different method of preparation has been employed. This process results in a mixture of the essential oil, the organic soluble resins and the related materials present in the spice in combination with whatever non-volatile fatty oil the original spice or herb may contain depending on the type of solvent selected for extraction. Oleoresins produced from seed materials, for example, will contain larger percentages of fatty oil than oleoresins produced from plant materials.

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\* These are trade names of new products developed by Fritzsche Brothers, New York, patents registered and pending.



Oleoresins, therefore, contain all the flavouring principles present in the original spice or herb material. The use of the essential oil alone would preclude, in some cases, the total flavour portions of certain materials such as contained in black pepper or ginger. In these cases, the constituents in the spice which are responsible for pungency are not present in the essential oil since they are not volatile; only the Oleoresin which includes these principles will provide the complete flavour effect.

By their very nature Oleoresins have built-in stability to high temperature applications. The natural resins which are present act as a fixative for the more volatile essential oil component. Since an essential oil lacks this natural fixative, it would tend to be more volatile in such cases than the Oleoresin.

In summary, an Oleoresin is the product of selected organic solvent extraction of an herb or spice which results in a material containing all the flavour constituents present in the starting material. In practice, the preparation of Oleoresins depends on various factors which must be determined through research and experience: the size of the particle, the type of solvent, the grade of spice or herb and design of equipment.



A Superesin (Fritzsche's trademarked name for a combination of essential oil and oleoresin) is a product which meets Federal Specification EE-S-645 of the United States of America.

By mixing oleoresins such as were described previously with the finest quality oils, the resultant product will provide standard dry soluble products when used at the recommended spice or herb equivalents. Generally, Superesins are more easily handled than an oleoresin and, in addition, are standardized in essential oil content making the resultant product exceptionally uniform.

Bakeresins are essential oil-oleoresin mixtures prepared specifically for use by the Baking Industry. These products also meet Federal Specification EE-S-645 of the United States of America and have the advantage of greater uniformity than the use of either the essential oil or the oleoresin itself.

Viandoresins are uniform mixtures of various essential oils and oleoresins which are used as complete spice flavourings for a variety of processed meat products.

Oleoresins may be employed in food products by direct addition where facilities exist as, for example, in the automatic meat processing industry. In cases such



as these, the item is added directly to the food product in proportion to its spice equivalent or replacement value.

In some cases, it is desirable to distribute the oleoresin product on the surface of a dry, edible carrier. Any dry, edible material can be used for this purpose such as soy bean protein, milk solids, starch, although the most commonly employed are salt and dextrose. When other materials such as ground spices or sodium nitrite are added, the complete mixture of these results in what is commercially known as a dry soluble seasoning. In some cases, however, the term "dry soluble" is applied to a simple mixture of the oleoresin-type product on a carrier.

In order to prepare a dry soluble using an oleoresin-type material, a small quantity of it is mixed with the dry material. This results in a concentrated dry soluble seasoning which will have a "wet" appearance and exhibit an agglomerated appearance. This concentrated dry soluble is then added to additional dry material which, after mixing, will result in the finished product. The reason for the premix: in certain cases, direct addition of the small quantity of the oleoresin-type product, required in the making of a dry soluble, to the entire amount of dry material may result in "balling" and mixing difficulty.

On a small scale, the preparation of a dry soluble can be accomplished by merely stirring the liquid flavouring portion and the dry material; however, large scale mechanized mixing equipment is often preferred. In order to facilitate the distribution of the flavouring material, one makes a premix with the dry carrier in which the flavouring material is at a high concentration. For example, 5 pounds of Oleoresin Ginger is mixed with 10 pounds of dextrose. This is thoroughly blended and added to 85 pounds of dextrose in the mixer. The final mixing is then accomplished resulting in 100 pounds of Dry Soluble Ginge Seasoning. This method of preparation, using a premix, prevents lumping and balling which could occur if 5 pounds of the oleoresin is added directly to 95 pounds of the carrier, and mixing begun.

#### THE ADVANTAGES OF OLEORESINS

The use of oleoresin-type products provides the food manufacturer with many outstanding advantages.

##### 1. UNIFORMITY OF FLAVOUR

Since these materials have been extracted from spices or herbs which tend to vary from crop year to crop year, and with the age of the raw material, the use of the extractives tends to minimize variations of this nature.



## 2. STABILITY

When natural spices and herbs are stored over long periods of time, the volatile essential oil present sometimes is lost through evaporation (especially in the ground state) or through polymerization and oxidization. With extracted material these effects are minimized, especially losses due to volatilization.

## 3. STORAGE

The equivalent flavouring of hundreds of pounds of voluminous spice or herb material is usually obtained from a small container of the oleoresin-type product.

## 4. MICROBIOLOGY

Through use of somewhat elaborate sterilization techniques, spices and herbs can be made bacteria-free. In contrast, oleoresin-type products are not only bacteria-free but free from mold, fungus or other contaminants sometimes associated with the raw materials.

## 5. ECONOMY

Since oleoresin-type extractives remove the entire flavouring portion of a spice or herb, the entire flavour effect from them is now made available. With spices or herbs, no matter how finely ground, there are always some cells which contain the flavouring principles tending to make these unavailable for perception. In general, roughly 50% savings in cost can be realised and yet, the flavour effect in the food product will be maintained at an equal level.

THE SPICE EQUIVALENTS OF DIFFERENT OLEORESINS

	<u>Specifications</u>	<u>Spice Equivalent</u>
<u>PEPPER</u>		
Oleoresin Black Pepper Decolorized	Light yellow-green semi-solid, 23-27% volatile oil 53-57% piperine	4½-6
Superesin Black Pepper	Light yellow-green semi-solid, min. 15% volatile oil min. 55% piperine	4½
Oleoresin White Pepper	Light brown semi- solid, 10-15% volatile oil 60-65% piperine	4½-6
Fritzbro Black Pepper Soluble	Pourable, brown, somewhat viscous liquid, 12-15% volatile oil 26-29% piperine	8-9
Fritzbro White Pepper Soluble	Pourable tannish- brown, somewhat viscous, 5-8% volatile oil 28-32% piperine	8-9

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CARDAMOM

Superesin Cardamom	Dark green liquid, min. 50% volatile oil	4
Bakeresin Cardamom	Green liquid, 50% volatile oil	4

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GINGERSpecificationsSpice  
EquivalentOleoresin Ginger NF  
(African)Brown semi-solid,  
28-32%  
Volatile oil

4-6

Oleoresin Ginger NF  
(Jamaican)Brown liquid,  
30-35%  
volatile oil

4-6

Superesin Ginger

Dark brown semi-  
solid, min. 25%  
volatile oil

4

Bakeresin Ginger

Dark brown  
viscous liquid,  
25% volatile oil

4

TURMERICOleoresin Turmeric  
StandardRed-brown liquid  
colour value  
1,000

15-20

CAPSICUM

Oleoresin Capsicum

20,000 colour units  
150,000 scoville  
heat units

5-7

Oleoresin Capsicum  
High Pungency1,500 colour units  
500,000 scoville  
heat units

5-7

Oleoresin Capsicum  
1,000,000 Scoville  
UnitsColour value less  
than 1,000.  
1,000,000 scoville  
heat units

5.7

Superesin Capsicum

1,000 colour units  
540,000 scoville  
heat units.

5

<u>CORIANDER</u>	<u>Specifications</u>	<u>Spice Equivalent</u>
Superesin Coriander	Yellow liquid, min. 33% volatile oil	3
Bakeresin Coriander	Yellow, slightly greenish liquid, 33% volatile oil	3

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CELERY

Oleoresin Celery Fivefold	Green liquid, 12-14% volatile oil	3-5
Superesin Celery	Light green liquid, min. 10% volatile oil	3

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GARLIC

Oleoresin Garlic Special (fresh- juice effect)	Brownish-tan liquid, 5% volatile oil	50 (fresh) 12 (dehydra- ted)
Oleoresin Garlic Special (Cooked-toasted effect)	Brownish viscous liquid, 5% volatile oil	50 (fresh) 12 (dehydra- ted)

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STATISTICAL APPENDIX

PHYSICAL APPENDIX



Area, Production and Yield  
(with Index) of Pepper in India

(All India: 1949-50 to 1966-67)

Year	Area ('000 hectares)	Index of Area (1949-50 =100)	Production ( '000 Tonnes	Index of Pro- duct- tion (1949- 50=100)	Yield (in Kg. per hectare)	Index of Yield (1949-50 = 100)
1949-50	79	100.0	21.1	100.0	266	100.0
1950-51	80	100.5	20.5	97.2	263	96.7
1951-52	82	103.0	22.6	107.5	280	104.4
1952-53	82	103.0	21.7	102.8	280	99.8
1953-54	84	106.1	23.9	113.3	286	106.8
1954-55	86	108.1	26.8	127.3	302	117.8
1955-56	89	112.2	27.9	132.6	315	118.2
1956-57	89	112.8	27.7	131.6	303	116.7
1957-58	93	117.8	27.0	128.2	290	108.8
1958-59	93	118.0	26.8	127.2	280	107.8
1959-60	94	119.2	26.7	126.7	277	106.3
1960-61	103	129.5	28.3	134.8	272	104.1
1961-62	103	129.4	28.4	134.8	272	104.2
1962-63	102	128.9	26.1	123.9	255	96.1
1963-64	103	129.4	24.5	116.3	243	89.9
1964-65	102	129.1	24.0	113.9	235	88.2
1965-66	102	129.2	23.3	111.1	226	86.0
1966-67	102	129.2	23.0	110.9	228	85.8

Source: Area, Production and Yield of Principal Crops in India.

India's Annual Production of Pepper

1955-56 to 1966-67

Year	Production in Metric tonnes as per Directorate of Economics & Statistics, New Delhi	Estimates by Indian Pepper & Spice Trade Association Cochin (in tonnes)
1955-56	28,000	24,000
1956-57	27,000	22,000
1957-58	27,000	24,000
1958-59	26,000	24,000
1959-60	26,000	28,000
1960-61	28,340	28,000
1961-62	28,390	30,000
1962-63	26,110	28,000
1963-64	24,500	25,000
1964-65	24,310	30,000
1965-66	23,250	35,000
1966-67	22,980	33,000

Source: Seminar on Pepper - SEPC.



Estimated Production of Pepper in India1951-52 to 1975-76

(in tonnes)

Year	Exports	Production (MRCI estimates)
1951-52	15153	25153
1952-53	12607	22607
1953-54	12965	22965
1954-55	13998	23998
1955-56	13336	23336
1956-57	15079	25079
1957-58	13803	23803
1958-59	11671	23671
1959-60	20676	28676
1960-61	17202	28202
1961-62	21620	30620
1962-63	20868	27868
1963-64	18938	25938
1964-65	17381	28381
1965-66	26305	35305
1966-67	21785	30785
1967-68	24868	32000
1968-69	25500*	34000
1969-70	27500*	37500
1970-71	30000*	40000
1971-72	32000*	42000
1972-73	33000*	44000
1973-74	34000*	46000
1974-75	35000*	48000
1975-76	36000*	50000

\* Estimates

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BLACK PEPPER: STATEWISE DISTRIBUTION OF  
AREA, PRODUCTION & YIELD PER ACRE IN INDIA

1950-51 to 1966-67

AREA ('00 ACRES)

Year	Kerala	Madras	Mysore	All India
1950-51	1903	4	63	1970
1951-52	1953	4	63	2020
1952-53	1950	4	63	2017
1953-54	2010	4	62	2076
1954-55	2010	4	59	2123
1955-56	2140	4	52	2196
1956-57	2149	5	55	2209
1957-58	2247	5	55	2307
1958-59	2239	5	66	2310
1959-60	2261	7	70	2338
1960-61	2465	4	69	2538
1961-62	2467	7	58	2532
1962-63	2452	7	54	2517
1963-64	2454	5	59	2518
1964-65	2459	5	61	2525
1965-66	2462	5	57	2524
1966-67	2462	5	57	2524

PRODUCTION ('00 TONNES)

1950-51	205	neg.	5	210
1951-52	225	neg.	5	230
1952-53	220	neg.	5	225
1953-54	230	neg.	5	235
1954-55	260	neg.	4	264
1955-56	270	neg.	5	275
1956-57	268	neg.	5	273
1957-58	260	-	6	266
1958-59	250	-	14	264
1959-60	249	1	13	263
1960-61	266	neg.	13	279
1961-62	265	1	13	279
1962-63	241	1	13	255
1963-64	224	neg.	16	240
1964-65	222	1	17	240
1965-66	217	1	15	233
1966-67	214	1	15	230

Contd....P. A119



Table continued from P.A118

Year	Kerala	Madras	Mysore	All India
<u>YIELD PER ACRE (in lb.)</u>				
1950-51	241	-	178	230
1951-52	258	-	178	255
1952-53	253	-	178	250
1953-54	256	-	181	254
1954-55	283	-	152	279
1955-56	283	-	215	279
1956-57	279	-	204	277
1957-58	259	176	244	258
1958-59	250	179	475	256
1959-60	247	160	416	252
1960-61	242	193	410	246
1961-62	241	192	513	247
1962-63	220	187	519	227
1963-64	201	-	608	210
1964-65	199	212	622	210
1965-66	195	203	587	204
1966-67	192	208	588	201

Source: i) Directorate of Economics & Statistics,  
Ministry of Food & Agriculture -  
Area, Production and Average Yield.

ii) Agricultural Situation in India.

Districtwise Area, Production and Yield  
of Pepper in Kerala State (Area in  
Hectares, Production in M.Tons, Yield  
in Kg. per Hectare) 1956-57 to 1966-67

Districts	1956-57	1957-58	1958-59	1959-60	1960-61	1961-62
	<u>AREA</u>					
Trivandrum	8539	8100	8065	8065	8436	8685
Quilon	7284	5432	5275	5233	5279	5229
Alleppey	-	1780	1710	1732	1752	1631
Kottayam	17725	13066	13058	13059	14079	14176
Ernakulam	-	6508	6641	6633	6829	7021
Trichur	1595	545	545	546	692	692
Palghat	2431	3386	3419	3420	3422	4320
Kozhikode	13546	12687	12873	13100	16064	16078
Cannanore	35747	39312	39120	39723	43202	42912
STATE	86967	90916	90916	91491	99755	99844

Districts	1962-63	1963-64	1964-65	1965-66	1966-67
Trivandrum	8429	8429	8429	8429	8429
Quilon	4742	4753	4764	4764	4764
Alleppey	1403	1241	1275	1275	1275
Kottayam	13915	14081	14305	14448	14448
Ernakulam	6807	6807	6807	6807	6807
Trichur	728	738	738	738	738
Palghat	3480	3480	3480	3480	3480
Kozhikode	16071	15984	15989	15989	15989
Cannanore	43665	43764	43765	43765	43765
STATE	99240	99382	99582	99695	99695



Table Continued from P.A120

Districts	1956-57	1957-58	1958-59	1959-60	1960-61	1961-62
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PRODUCTION

Trivandrum	3962	3454	3454	3454	3637	3505
Quilon	3353	2448	2328	2276	2215	2083
Alleppey		803	726	711	732	518
Kottayam	8128	5487	5360	5354	5507	4968
Ernakulam	-	2824	2790	2774	2804	2897
Trichur	723	234	236	234	295	310
Palghat	541	680	691	691	691	686
Kozhikode	2892	2560	2536	2560	3241	3190
Cannanore	7630	7946	7309	7224	7904	8818
STATE	7229	26436	25430	25278	27026	26975

Districts	1962-63	1963-64	1964-65	1965-66	1966-67
Trivandrum	3248	3067	3157	3157	3094
Quilon	2111	2019	2025	2005	1925
Alleppey	440	407	370	355	305
Kottayam	4724	4462	4451	4400	4496
Ernakulam	2029	2030	2025	2025	2025
Trichur	318	323	323	323	323
Palghat	531	518	502	487	497
Kozhikode	2649	2621	2516	2390	2294
Cannanore	8411	6976	6859	6447	6447
STATE	24461	22423	22228	21685	21406

Table Continued from P. A121

Districts	1956-57	1957-58	1958-59	1959-60	1960-61	1961-62
	<u>YIELD</u>					
Trivandrum	464	426	428	428	431	404
Quilon	460	451	441	435	420	398
Alleppey	-	451	425	411	418	318
Kottayam	459	420	410	410	391	350
Ernakulam	-	427	420	418	411	413
Trichur	453	429	433	429	425	448
Palghat	214	201	202	202	202	159
Kozhikode	213	202	197	195	202	159
Cannanore	213	202	187	182	183	205
STATE	313	291	281	276	271	270

Districts	1962-63	1963-64	1964-65	1965-66	1966-67
Trivandrum	385	364	375	375	375
Quilon	445	425	425	421	404
Alleppey	314	304	290	278	239
Kottayam	339	317	311	311	311
Ernakulam	298	298	297	297	297
Trichur	437	438	438	438	438
Palghat	153	149	144	140	143
Kozhikode	165	164	157	149	143
Cannanore	193	159	157	147	147
STATE	246	226	223	218	215

Source: The Bureau of Economics and Statistics,  
Trivandrum.



COMPARATIVE YIELD FROM IMPROVED  
VARIETIES AND LOCAL POPULAR VARIETY

Characteristics	Panniyur-I	Kalluvally (local popular variety)
1. Maximum yield per vine obtained for the past five years.	10.500 Kg. (green)	5.500 Kg. (green)
2. Minimum yield per vine obtained for the past five years.	5.325 Kg. (green)	0.931 (green)
3. Mean yield for the past five years.	7.331 Kg. (green)	1.751 Kg. (green)
4. Mean length of the spike	16.2 c.m.	10.8 c.m.
5. Mean number of berries per spike	98	65
6. Percentage of bisexual flowers.	87.7	53.4
7. Weight 100 green berries	16.8 gm.	12.4 gm.
8. Volume of 100 green berries	17.0 c.c.	12.0 c.c.
9. Percentage of driage	32.8	31.4

Source: Seminar on Pepper - SEPC.

SHARE OF PEPPER IN TOTAL EXPORT EARNINGS

1966-67 and 1967-68

Spices	Export Earnings		Export Earnings	
	<u>—(Rs. lakhs)—</u>		<u>(in per cent)</u>	
	1966-67:	1967-68:	1966-67:	1967-68:
Pepper	1183	1302	42.6	48.2
Cardamom	813	716	29.2	26.5
Chillies	278	205	10.0	7.6
Ginger	161	128	5.8	4.7
Turmeric	140	132	5.0	4.9
Curry Powder	43	51	1.5	1.9
Celery Seed	43	49	1.5	1.8
Others	119	115	4.4	4.4
Total	2780	2698	100.0	100.0



UNIT VALUE REALISED FROM EXPORTS OF PEPPER  
FROM INDIA

1950-51 to 1967-68

Year	Quantity ('000 Tonnes)	Value (Rs.lakhs)	Unit Value (Rs.per tonne)
1950-51	9.8	1282	13081
1951-52	15.1	2322	15377
1952-53	12.6	1606	12746
1953-54	12.6	1271	10087
1954-55	14.0	698	4985
1955-56	13.3	470	3587
1956-57	11.7	339	2897
1957-58	14.7	301	2572
1958-59	10.8	229	1557
1959-60	20.6	817	3966
1960-61	17.2	850	4941
1961-62	21.7	808	3723
1962-63	20.8	657	3158
1963-64	18.9	691	3556
1964-65	17.1	671	3923
1965-66	25.7	1085+	4221+
1966-67	21.8	1138+	5220+
1967-68	24.9	1302+	5229+

+ Part of this increase may be due to the devaluation of the rupee in June 1966.

STANDARDS FOR DIFFERENT TYPES OF BLACK PEPPER

S. No.	Schedule	Type	Grade Designation	Size in mm.	Extra-neous matter %	Light berr-ies %	Mois- ture %
1.	Schedule-I	Garbl- ed Mala- bar Black Pepper	1)MG Grade-1 2)MG Grade-2	-	0.5	2.0	11.0*
2.	Schedule-II	Ungarb- led Malabar Black Pepper	1)MUG Grade-1 2)MUG Grade-2	-	2.0	7.0 10.0 Pin- heads	12.0* 12.0
3.	Schedule-III	Garb- led Light Black Pepper	1)GL Gra- de Special 2)GL Gra- de-1 3)GL Gra- de-2	-	2.0 4.0 6.0	- 5.0 10.0	- - -
4.	Schedule-IV	Pin- heads	1)PH Gra- de-1	-	6.0	-	-
5.	Schedule-V	Non- speci- fied	1)NS Gra- de-2	-	4.0	-	-
6.	Schedule-VI	A.Garb- bled Telli- cherry  Bold Black Pepper	1)TGSEB  2)TGEB 3)TG 50%	4.75 4.25 4.25	0.5 0.5 0.5	2.0 3.0 3.0	11.0* 11.0* 11.0*

\* A tolerance of 0.5% will be allowed during monsoon season.



PERCENTAGE OF DIFFERENT GRADES IN  
TOTAL QUANTITY OF BLACK PEPPER  
AGMARKED

1963 to 1966

Grades	1963	1964	1965	1966
<u>TELLICHERRY BOLD</u>				
TGSEB	1.0	3.1	2.5	2.1
TGEB	0.8	3.7	4.0	6.7
TG	-	-	-	-
<u>MALABAR GARBLED</u>				
MG-1	82.5	77.2	83.1	82.0
MG-2	1.8	0.1	Neg.	Neg.
<u>MALABAR UNGARBLED</u>				
MUG-1	4.8	2.3	0.9	1.0
MUG-2	1.4	1.8	0.4	0.6
<u>GARBLED LIGHT</u>				
GL Special	Nil	Nil	1.2	0.7
GL-1	1.4	4.2	2.4	1.0
GL-2	2.3	4.3	2.0	2.0
<u>PINHEADS</u>				
PH-1	0.6	0.8	0.9	0.8
<u>NON-SPECIFIED</u>				
NSX	3.4	2.5	2.6	2.7
Total:	100.0	100.0	100.0	100.0

Neg. = Negligible

SHARE OF SELECTED COUNTRIES &  
REGIONS IN PEPPER PRODUCTION

(per cent)

Countries	1935-39	1950-52	1956-57	1966
India	17.83	59.42	35.55	28.78
Indonesia	69.32	16.23	28.09	25.41
Sarawak	2.85	4.97	22.64	18.52
Ceylon	2.74	11.52	7.72	12.77
Brazil	-	0.79	2.40	7.51
Other countries	7.26	7.07	3.60	7.01
All countries	100.00	100.00	100.00	100.00



WORLD BALANCE SHEET OF PRODUCTION  
& CONSUMPTION FOR PEPPER: 1965

(India's Peak Year of Exports of Pepper)

(in '000 tonnes)

	Importers					Esti- mated cons- ump- tion in the produ- cing coun- tries	Total prod- uction (5+6)
	USA & Canada	Europe	USSR & East Europe	Other Coun- tries	Total		
	1	2	3	4	5	6	7
India*	7.1	2.6	12.9	3.7	26.3	9.0	35.3
Indonesia	10.0	3.0	-	-	13.0	2.0	15.0
Sarawak, Malaya & Singapore	2.0	5.0	-	11.0	18.0		
Brazil	3.0	2.0	-	3.0	8.0		
Malagasy Republic	-	1.0	-	1.0	2.0	9.0	40.0
Cambodia	-	2.0	-	-	2.0		
Ceylon	-	-	-	1.0	1.0		
Total	22.1	15.6	12.9	19.7	70.3	20.0	90.3

\*India's figures refer to the financial year 1965-66

WORLD BALANCE SHEET OF PRODUCTION  
AND CONSUMPTION OF PEPPER: 1967

(in '000 tonnes)

	Importers				Total	Esti- mated cons- ump- tion in the produ- cing coun- tries	Total prod- uction (5+6)
	USA & Canada	Europe	USSR & East Europe	Other Coun- tries			
	1	2	3	4	5	6	7
India	2.4	2.1	13.8	2.6	20.9	9.0	29.9
Indonesia	20.0	5.0	-	-	25.0	2.0	27.0
Sarawak Malaya & Singapore	2.0	5.0	-	10.0	17.0	8.0	38.5
Brazil	3.5	2.0	-	3.0	8.5		
Malagasy Republic, Cambodia, Ceylon & Others	1.0	2.0	-	2.0	5.0		
Total	28.9	16.1	13.8	17.6	76.4	19.0	95.4

Note: Figures for India relate to the calendar year 1967.  
For other countries the figures have been estimated  
on the basis of the available data.



WORLD BALANCE SHEET OF PRODUCTION &  
CONSUMPTION FOR PEPPER: 1971

(in '000 tonnes)

Producers	Importers					Esti- mated con- sump- tion in the produ- cing coun- tries	Total produ- ction (5+6)
	USA & Canada	Europe	USSR & East Europe	Other coun- tries	Total		
	1	2	3	4	5	6	7
India	6	4	16	4	30	10	40
Indonesia	14	4	4	2	24	3	27
Malaya & Singapore	2	5	-	8	15		
Brazil	3	2	-	5	10		
Malagasy Republic	-	1	-	1	2	12	42
Cambodia	-	2	-	-	2		
Ceylon	-	-	-	1	1		
Total	25	18	20	21	84	25	109

WORLD BALANCE SHEET OF PRODUCTION  
AND CONSUMPTION FOR PEPPER: 1976

(in '000 tonnes)

Producers	Importers					Esti- mated con- sump- tion in the produ- cing coun- tries	Total produc- tion (5+6)
	USA & Canda	Europe	USSR & East Europe	Other Coun- tries	Total		
	1	2	3	4	5	6	7
India	10	5	16	5	36	14	50
Indonesia	12	6	6	5	29	3	36*
Sarawak, Malaya & Singapore	2	5	-	11	18		
Brazil	3	3	-	6	12		
Malagasy Republic	-	2	-	1	3	13	49
Cambodia	-	2	-	-	2		
Ceylon	-	-	-	1	1		
Total	27	23	22	29	101	30	135*

\* Difference between production and consumption  
will constitute excess supply (or buffer stocks).



PEPPER - SOME IMPORTANT MAGNITUDES

Qty. = '000 tonnes  
Value = Million \$

	1950*		1960		1965	
	Q	V	Q	V	Q	V
1. World Production	42	150.4	59	74.4	90	95.0
2. World Exports	25	89.5	40	51.3	70	73.9
3. Indian Production	22	78.8	28	35.9	35	36.9
4. Indian Exports	13	46.6	19	24.4	26	27.5
5. Major Competitors						
a) Indonesia	6	21.5	13	16.6	13	13.7
b) Malaya, Singapore and Sarawak	3	10.7	4	5.1	18	19.0
c) Brazil	-	-	2	2.6	8	8.4
d) Others	3	10.7	2	2.6	5	5.3
Total (incl. India)	25	89.5	40	51.3	70	73.9
6. Major Importing Countries						
a) U.S.A. & Canada	14	50.1	20	25.6	22	23.2
b) Europe	5	17.9	8	10.3	15	15.9
c) USSR & East Europe	neg.	-	7	9.0	13	13.
d) Other countries:	6	21.5	5	6.4	20	21.1
Total:	25	89.5	40	51.3	70	73.9

	1970		1975	
	Q.	V	Q	V
1. World Production	109	88.9	135	110.2
2. World Export	84	68.5	101	82.4
3. Indian Production	40	32.6	50	40.8
4. Indian Exports	30	24.5	36	29.4
5. Major Competitors				
a) Indonesia	24	19.6	29	23.7
b) Malaya, Singapore and Sarawak	15	12.2	18	14.7
c) Brazil	10	8.1	12	9.8
d) Others	5	4.1	6	4.9
Total (incl. India)	84	68.5	101	82.4

Table Continued from Page A133

	1970		1975	
	Q	V	Q	V
6. Major Importing countries:				
a) U.S.A. & Canada	25	20.4	27	22.0
b) Europe	18	14.7	23	18.8
c) USSR & East Europe	20	16.3	22	17.9
d) Other countries	21	17.1	29	23.7
Total:	84	68.5	101	82.4

\* Represents average of 1950-52

Note: Average prices used for value figures are:

1950:	162.4 Cents a lb.
1960:	58.2 Cents a lb.
1965:	47.9 Cents a lb.
1970:	37.0 Cents a lb.
1975:	37.0 Cents a lb.



PEPPER - SOME IMPORTANT MAGNITUDES

(Figures in per cent)

	1950	1960	1965	1970	1975
1. World Exports as % of world production	59.5	69.0	77.8	77.1	74.8
2. Indian production as % of world production	52.4	48.3	38.9	36.7	37.0
3. Indian exports as % of Indian production	59.1	67.8	74.3	75.0	72.0
4. Indian Exports as % of world exports	52.0	47.5	37.1	35.7	35.7
5. Major Competitors - percentage shares in world exports:					
a) Indonesia	24.0	32.5	18.6	28.6	28.7
b) Malaya, Singapore and Sarawak	12.0	10.0	25.7	17.9	17.8
c) Brazil	-	5.0	11.4	11.9	11.9
d) Others	12.0	5.0	7.2	5.9	5.9
Total (incl. India)	100.0	100.0	100.0	100.0	100.0
6. Major importers - percentages shares in world imports:					
a) USA & Canada	56.0	50.0	31.4	29.8	23.7
b) Europe	20.0	20.0	21.4	21.4	22.8
c) USSR & East Europe	neg.	17.5	18.6	23.8	21.8
d) Other countries	24.0	12.5	28.6	25.0	28.7
Total:	100.0	100.0	100.0	100.0	100.0

TRADE IN PEPPER

(in '000 metric tons)

Country	1937-39	1950-52	1955-57	1960	1961
	Average	Average	Average		
<u>EXPORTS</u>					
Main Producers					
India	1.2	14.7	13.5	18.7	17.4
Indonesia	51.7	5.9	16.7	12.7	19.1
Sarawak	2.7	1.9	16.9	4.2	11.1
Brazil	-	-	0.2	1.9	2.9
Madagascar	0.2	0.3	0.6	1.0	1.3
Cambodia	4.7	0.7	0.9	1.2	1.1
Ceylon	-	0.2	0.3	0.7	-
Total:	60.4	23.8	49.0	40.4	53.1
Country	1962	1963	1964	1965	1966
India	25.0	18.9	16.4	22.7	24.9
Indonesia	11.0	28.0	23.2	12.3	20.3
Sarawak	11.8	11.6	12.3	17.9	13.3
Brazil	2.8	2.4	4.0	7.4	6.4+
Madagascar	1.1	0.9	1.9	1.5	1.1
Cambodia	0.8	0.9	0.8	1.8	1.5
Ceylon	-	0.1	0.6	0.7	0.3
Total:	52.5	62.8	59.3	64.3	67.8

Country	1937-39	1950-52	1955-57	1960	1961
	Average	Average	Average		
<u>RE-EXPORTS</u>					
Main Pepper Markets					
United Kingdom	1.6	0.9	0.6	1.0	0.2
United States	1.8	0.3	0.2	0.2	0.2
Fed. of Malaya	11.3	4.1	26.7	21.8	26.0
Hong Kong	1.7	0.1	0.2	0.1	0.1
Total:	16.4	5.3	27.7	23.1	26.5
	1962	1963	1964	1965	1966
United Kingdom	0.2	0.2	0.2	0.2	0.2*
United States	0.3	0.3	0.4	0.4	0.4*
Fed. of Malaya	26.5	31.1	14.8	19.0	19.4*
Hong Kong	0.1	0.2	0.5	0.8	1.5
Total:	27.1	31.6	15.9	20.3	21.5

Contd....P. A137



Contd. from P. A136

Country	1937-39 Average	1950-52 Average	1955-56 Average	1960	1961
<u>MAIN IMPORTERS</u>					
Argentina	0.8	0.2+	0.8	0.3	0.7
Australia	-	0.3+	0.8	0.7	0.7
Belgium	0.4	0.2+	0.5	0.3	0.4
Canada	0.9	0.8	1.3	1.5	1.4
Fed.of Malaya	10.6	3.8	27.4	16.2	26.6
France	2.5	1.4	2.4	2.1	2.4
Germany+	5.5	1.4	3.6	3.0	4.1
Hong Kong	2.0	0.2	0.4	0.2	0.3
Italy	1.8	0.8	1.4	1.7	2.0
Japan	-	-	0.3	0.6	0.8
Netherlands	0.6	0.1	0.4	0.2	0.5
Sweden@	0.9	0.2	0.6	0.4	0.5
United Kingdom	4.4	2.4	3.3	3.7	3.5
United States	25.4	13.0	16.6	18.2	16.0
Yugoslavia	-	-	0.2	0.4	0.8
Total:	62.0+	25.2*	60.0	49.5	60.7
U.S.S.R., Mainland China, ( Eastern Europe	2.0	-	5.9	7.2	606
Total:	64.0*	26.2*	65.9	56.7	67.3

Contd.....P. A138

Continued from Page 137.

Country	1962	1963	1964	1965	1966
<u>MAIN IMPORTERS</u>					
Argentina	1.0	0.9	1.0	1.3	1.3*
Australia	0.7	0.9	0.7	0.9	0.9
Belgium	0.5	0.5	0.5	0.6	0.6
Canada	1.7	1.7	1.5	1.8	1.6
Fed. of Malayal	18.5	30.4	10.5	16.1	12.0
France	3.3	3.0	3.2	2.9	3.5
Germany+	4.4	4.4	4.1	5.4	4.8
Hong Kong	0.2	0.3	0.6	0.9	2.0
Italy	2.1	2.2	2.4	2.5	2.4
Japan	0.9	1.0	1.0	1.4	1.4
Netherlands	0.5	0.6	0.6	0.6	0.7
Sweden@	0.4	0.5	0.4	0.4	0.6
United Kingdom	3.1	4.1	3.3	2.7	2.8
United States	17.9	20.0	21.5	21.6	17.1
Yugoslavia	0.6	0.7	0.5	1.0	1.7
Total ..	55.8	71.3	52.0	60.0	53.4
USSR, Mainland China, Eastern Europe.	7.4	10.6	12.8	10.6	12.3*
Total:	63.2	81.9	64.8	70.6	65.7*

\* Estimate

+ Postwar figures relate to the  
Federal Republic of Germany.

@ Including Capsicum until 1956.



SOURCES OF IMPORTS INTO CERTAIN COUNTRIES

('00 tonnes)

Countries	1961	1962	1963	1964	1965	1966
<u>UNITED STATES</u>						
Malaysia & Singapore	4.6	2.5	2.0	1.0	22	4.5
India	53	96	28	17	55	58
Cambodia	-	-	-	-	-	-
Indonesia	91	70	149	164	100	85
Malagasy Republic	-	-	-	1	4	-
Brazil	11	9	11	24	33	21
Other Countries	0.5	1.5	1	3.5	3	1.5
Total:	160	179	200	216	216	171

FRANCE

Malaysia & Singapore	4	8.6	7.6	2	1	5
India	-	2	2	-	-	0.5
Cambodia	8	9	6	7	14	10
Indonesia	2	3	-	5	3	5
Malagasy Republic	10	9	7	11	6	10
Brazil	-	0.5	2.5	6	4	4
Other Countries	-	-	0.5	0.8	0.4	0.2
Total:	24	33	29	33	29	35

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Countries	1961	1962	1963	1964	1965	1966
<u>WEST GERMANY</u>						
Malaysia & Singapore	31	32	29	12	20	14
India	0.5	2	-	0.2	0.9	0.4
Cambodia	-	-	-	-	-	-
Indonesia	5	7	9	22	19	24
Malagasy Republic	-	-	-	0.4	2.2	0.7
Brazil	3.6	4.7	5.6	6.6	10	8.1
Other Countries	-	-	0.1	0.2	0.7	0.3
Total:	41	45	44	42	53	48
<u>ITALY</u>						
Malaysia & Singapore	4	3	3	3.2	4	2.3
India	15	17	17	18	18	19
Cambodia	-	-	-	-	-	-
Indonesia	0.5	0.5	0.8	1.2	1	1.4
Malagasy Republic	-	-	-	0.1	1.8	0.8
Brazil	0.5	0.5	0.1	0.3	-	0.2
Other Countries	-	-	0.5	0.9	0.3	0.2
Total:	20	20	21	24	25	24

- Nil, negligible or included with "Other Countries"  
Source: 1961-62 Plantation Crops No.10, 1964, Commonwealth Economic Committee.  
1963-64 Plantation Crops No.11, 1967, Commonwealth Secretariat, Commodities Division.



AREA, PRODUCTION AND YIELD  
OF PEPPER IN INDONESIA

Year	Planted Area ( '000 hec- tares)	Production ( '000 tonnes)	Yield per hectare (tonnes)	Yield per Acre (Tonnes)
1952	13.0	6.8	0.52	0.21
1953	15.1	5.7	0.38	0.15
1954	21.4	15.6	0.73	0.30
1955	23.0	17.9	0.77	0.31
1956	28.3	20.0	0.71	0.29
1957	27.5	22.0	0.80	0.32
1958.	33.4	16.8	0.50	0.20
1959	34.3	14.1	0.41	0.17
1960	33.7	12.2	0.36	0.15
1961	34.7	13.7	0.40	0.16
1962	37.0	55.4	1.50	0.61
1963	38.4	57.9	1.51	0.61
1964	36.6	46.4	1.27	0.51
1965	37.1	46.5	1.25	0.51

EXPORTS OF PEPPER FROM INDONESIA: 1960-65

(Qty. in '000 Kgs.)

Countries	1960	1961	1962	1963	1964	1965
Belgium & Luxemburg	4	151	297	..	1450	207
France	-	5	3	..	1282	299
Hong Kong	-	-	-	..	-	532
Netherlands	-	-	-	..	1597	2114
Singapore	9926	10422	2235	..	-	-
U.K.	1457	6381	7230	..	1430	171
U.S.S.R.	1032	21	23	..	1469	414
U.S.A.	236	1664	680	..	12350	6785
W. Germany	-	329	229	..	2313	1285
Other countries	51	106	264	..	1339	444



EXPORT PRICES OF BLACK LAMPONG  
PEPPER IN INDONESIA: 1951-63

(Per 100 Kg.)

Year	Export Price (In Rupiah)	Export Price ( In \$ )
1951	2565	225.00
1952	3031	265.88
1953	2583	226.58
1954	1478	129.65
1955	745	65.35
1956	551	48.33
1957	469	41.14
1958	457	40.09
1959	492	43.16
1960	3716	82.57
1961	3600	80.00
1962	2872	63.82
1963	2313	51.40

Note: Official Exchange Rate:

1951-59: \$ 1.00 = Rupiah 11.40

1960-63: \$ 1.00 = Rupiah 45.00





AN EXPORT FEASIBILITY STUDY FOR INDIAN SPICES  
CARDAMOM





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## SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

**Producers** India, Ceylon, Guatemala, Thailand are the major producers of cardamom in the world. Cardamom is also produced in smaller quantities in Laos, Vietnam, Costa Rica, El Salvador and Tanzania.

**Area** The largest area under cardamom cultivation is in India. India accounts for 90 per cent of the total world acreage. Cardamom plantations in India cover about 73100 hectares.

2.2 Kerala, Mysore and Madras are the only States in India where cardamom is grown. Kottayam in Kerala State, Coorg and Hassan in Mysore State are the important cardamom growing districts in India.

2.3 About 38 per cent of the area under this crop in Kottayam District consists of holdings of less than 5 acres while it is 25 per cent in case of Coorg district and 23 per cent in case of Hassan district. The present tendency is towards smaller holdings.

2.4 "Large" cardamom - *Amomum Subulatum* Rozb is also grown in India (in West Bengal and Sikkim).

**Production** The total world production of cardamom averages around 5100 tonnes per annum. In 1963 the world production reached the new peak of 6100 tonnes. In that year India's output of cardamom was of the order of 4100 tonnes or more than 67 per cent of the world production.



3.2 India still remains the largest producer of cardamom in the world followed by Ceylon and Guatemala in that order. The current level of output of Indian cardamom is around 3000 tonnes.

3.3 India should increase her cardamom production to the tune of 3500 tonnes by 1975-76 so as to achieve the export target of 2650 tonnes set for that year.

3.4 Agricultural research institutions in India should also concentrate on the right type of fertilizers which are appropriate for increasing the yield rate of cardamom. In addition to this, research should also be done on high yielding varieties.

3.5 The fall in production in recent years is mainly attributed to the 'Katte' disease which is prevalent in almost all the cardamom plantations in India.

3.6 Land leasing pattern, deforestation and methods of irrigation are the major factors which contribute very much for the increased production.

3.7 Central Government, through the Cardamom Board should extend all financial help to plantation owners. Besides this, sincere attempts should be made to eradicate 'Katte' disease with the help of Agricultural research institutions. In this connection, the Poona Centre of Indian Agricultural Research Institute has been conducting research on the 'mosaic' disease.



So far no positive and reliable measures have been found out.

3.8 In many cases, it is reported that cardamom is being cultivated in areas which are unsuited for cardamom crop. State Governments with the cooperation of Cardamom Board should prohibit such areas for cardamom plantations. In this connection, it can be noted that the registration of cardamom plantations has been made compulsory since 1967 in the States of Madras, Mysore and Kerala. This will facilitate the State Governments to withdraw such unsuitable lands from the cardamom cultivation.

Exports The world export of cardamom averaged about 2480 tonnes per annum during the period 1957 to 1967, having touched the maximum of 3100 tonnes in 1962.

4.2 Exports of Indian cardamom rose sharply from 2035 tonnes in 1960-61 to 2310 tonnes in 1963-64. Since then, there has been a steady fall in exports year after year, and during 1967-68 they were of the order of 1536 tonnes.

4.3 India is the largest single exporter of cardamom in the world followed by Guatemala and Ceylon. Thailand also exports cardamom but in small quantities.

Markets World's largest market for cardamom is in the Middle East. About 36 per cent of the world exports go to the Arabian States. Among the European countries Sweden is the largest importer of cardamom.

5.2                   The major markets for Indian cardamom are also in the 'Middle East', Sweden and the U.S.S.R. in that order. About 23 per cent of cardamom exported from India reaches Saudi Arabia, about 13 per cent Kuwait, and about 11 per cent Sweden.

5.3                   Important markets for Guatemala cardamom are Sweden, U.S.A., Saudi Arabia and West Germany, while Ceylon has her major markets in Saudi Arabia and Jordan.

5.4                   India cannot afford to lose the important cardamom markets namely the Middle East and Sweden. In this connection, it is necessary for India to make extensive publicity and free distribution of samples in these markets with a view to counteract the growing competition from Guatemala.

5.5                   The U.S.A. and the U.S.S.R. are the two countries where India has a wider scope for her cardamom in the coming years. The State Trading Corporation should be entrusted with the task of exploiting these markets.

5.6                   If adequate efforts were made in the direction of extending our markets, Australia will be able to provide a good market for Indian cardamom.

Consumption           Among the importers, Arabian countries are the largest consumers of cardamom, with the per capita consumption of 72 grams.

6.2                   However, Ceylon is believed to consume more than 100 grams per head since her major share of production goes for local consumption.



## Unit Value of Exports

In most of the years the unit value of exports of cardamom from Ceylon is much

higher than that of Indian cardamom except in the year 1962 when the value of Indian cardamom was \$ 2.6 per Kg. as against \$ 1.6 per Kg. for Ceylon cardamom. However, the cardamom exports from Guatemala earn the lowest value per unit as compared to Indian as well as Ceylon variety.

## Quality

Indian cardamom tops in quality with its characteristic flavour and aroma. The importers in the Middle East Zone consider it superior to other cardamoms. However, Indian cardamom does not match well with Guatemala cardamom in external appearance, particularly in colour and its uniformity.

8.2 Ceylon cardamom in the opinion of the foreign importers contacted, is far inferior to Indian and Guatemala cardamoms both in quality and appearance.

8.3 Because of its external appearance with parrot green colour, Guatemala cardamom is becoming more and more popular in the Arabian countries. It is also free from thrip and other infested capsules. As a result, currently Guatemala is emerging as a potential rival in the Middle East markets. India should make necessary efforts in this connection to export as far as possible the cardamom of uniform size without thrip marks, or pest infected capsules.

8.4 It is suggested to send a delegation consisting of Indian plantation owners to Guatemala in order to learn the techniques adopted there to maintain the green colour in cardamom.

Types of Carda- About 72 per cent of the cardamom exported  
mom exported  
from India from India during 1966-67 was of small

Alleppey green, about 7 per cent small Coorg green, about 7.7 per cent large cardamom. Bleached or bleachable cardamom shared about five per cent of exports in that year.

Bleached Cardamom Bleached cardamom exported from India is not quite comparable with the bleached variety from Guatemala. In order to meet the growing demand for this variety in the West European markets it is very important for India to adopt the latest techniques of bleaching employed by Sweden.

Cardamom oil Besides the exports of wholesome cardamom, India should venture to distil and export substantial quantities of cardamom oil. This will not only save considerable amount of freight charges but also increase the foreign exchange earnings.

11.2 India should use cardamom of inferior quality for the purpose of distillation of oil. It is found that cheaper grade materials like thrip-marked cardamom and splits are as good as whole cardamom for



distillation. This will enable India to utilize the rejects for earning foreign exchange.

Cardamom Coffee      It is suggested that instant cardamom coffee and instant cardamom tea can be exported in consumer packs to the Middle East and the European markets. This is possible only after studying the consumption habits of the people in these regions. Such market studies should be undertaken jointly by the Cardamom Board, Coffee Board and Tea Board.

Cardamom Board      There seems to be no co-ordination between the Agricultural research institutions which are undertaking studies on the development of cardamom plantations in India. It can be suggested here that Cardamom Board should be given wider powers not only to co-ordinate with these research organisations but also to follow up and implement the findings of the study.

## I - CARDAMOM CULTIVATION

Cardamom is the dried seed of a tall herbaceous perennial plant - *Ellettaria cardamomum*. The cardamom plant grows profusely in South India and is also cultivated on a commercial scale in Ceylon, Guatemala and Thailand. To a lesser extent, the plant also grows in Vietnam, Laos, Cambodia and El Salvador.

### VARIETIES OF CARDAMOM

The plant grows best in India and Ceylon at elevations of 2000 to 5000 ft. above sea level. The variety grown in Ceylon is known as VAR MAJUR THU, also known as great Oblong cardamom or long cardamom, while that grown in India under the name "Malabar" and "Mysore" cardamom belongs to the variety VAR. MINOR WATT. In addition, VAR. Mysorensis and VAR. laxiflora are known in South India and Manjarabad district of Mysore State respectively.

India also grows the "large" cardamom plant - *Amomum subulatum* Rozb. This plant is grown in Darjeeling district of West Bengal and in Sikkim. These plants are usually grown along "Jhoras" (small springs) in moist and shady areas along hilly slopes at elevations of 2,500 ft. to 5,500 ft.

### AREA UNDER CARDAMOM PLANTS

The total area under cardamom in the world cannot be assessed accurately as statistics of the area under



cardamom cultivation in Guatemala and Thailand are not available. Table No.1 gives the area under cultivation of cardamom in India and Ceylon.

India has the largest area under cardamom constituting possibly about 90 per cent of the total world acreage under cardamom cultivation; this is assuming that the total area under cardamom in Ceylon, Guatemala and Thailand would not exceed 8000 hectares (Ceylon had 5400 hectares under cardamom cultivation in 1966).

According to available statistics for the year 1965-66, the total area under cardamom cultivation in India is estimated at 72,800 hectares; this is 30.5 per cent more than the area in 1960-61. About 64 per cent of this area is located in Kerala State while Mysore State accounts for about 27 per cent; the remaining nine per cent is in Madras State (Table No.2).

Recently, there has been an increase in the area under cardamom cultivation in India. The total area in India under cardamom is currently estimated at 73,000 hectares out of a possible world total of about 81,000 hectares.

The estimate of 73,000 hectares is based on information collected by the erstwhile Directorate of Cardamom Development and Marketing. The latest figure available with the Cardamom Board, which is based on

information collected from the State Governments, is 67,824 hectares split up as follows:

Kerala	43,068
Mysore	19,146
Madras	5,610

The correct area under cardamom is still being worked out by the State Governments on the basis of certain figures furnished by the Revenue authorities, who have been authorised to register the cardamom estates.

#### SIZE OF HOLDINGS

According to surveys conducted in 1947, 54.6 per cent of total acreage under cardamom in Mysore State and 55.3 per cent in Kerala State was accounted for by holdings of above 50 acres (20.23 hectares); only 3.7 per cent and 3.8 per cent respectively was contributed by holdings below 5 acres (2.02 hectares).

Later surveys conducted and reported in the Report on the Marketing of Cardamom in India, 1963 (AMA series - 144) indicate that the pattern of land holding has shifted particularly in the more important cardamom growing districts of Kottayam in Kerala State and Coorg and Hassan districts in Mysore State. In these districts holdings of 50 acres and above have come down to 1.2 per cent, Nil, and 17 per cent respectively while holdings of less than 5 acres have increased to 38 per cent, 25 per cent and 23 per cent respectively. There is thus an indication that bigger units



have split up into smaller units. The patterns of size of the holdings in South Kanara, Ramanathpuram and Coimbatore districts have not shown any appreciable change.

#### COMPULSORY REGISTRATION OF CARDAMOM PLANTATIONS

Section 11(1) of the Cardamom Act, 1965 provides for registration of every owner of land with cardamom plants with the registering officer to be appointed for this purpose by the State Government. In pursuance of this provision the State Governments of Kerala, Mysore and Madras have promulgated the Cardamom Estate Owners' Rules under which every cardamom planter is required to register himself as an owner of a cardamom estate with the registering authorities appointed by them. The last date for submission of the applications for registration of estates expired by the middle of 1967. Many of the planters had not applied for registration as they were either unaware of the rules in this regard or own encroached or leased lands and consequently ignorant of the provisions of the Act. The State Governments have been requested to extend the time limit and the Government of Madras has acceded to the request. The other two Governments have not done so.

In view of the very slow progress made in the registration of the estates, the Cardamom Board recommended to the State Governments that the Chairman of the Cardamom Board should be nominated as the "Registering Officer"

under the rules framed by them. The Government of Madras have informed the Board that the Chairman of the Board cannot be appointed as the Registering Officer in view of the fact that the area under cardamom has to be verified by the Village Officers and the certificate of registration can be granted to the estate owners only after the revenue officials have satisfied themselves that the area is actually under cardamom. The other two Governments have not replied to the Board's communication and, it is understood, that the Government of Kerala will also take the same view as expressed by the Government of Madras. The process of registration has per force to be done by the State Governments.

The area registered so far is as follows:

Kerala	5,282 hectares
Madras	1,879 hectares
Mysore	153 hectares

#### METHODS OF CULTIVATION OF CARDAMOM IN INDIA

Cultivation of cardamom in India varies considerably in different regions from a mere collection of capsules from wild plants extending to regular plantation systems either individually as cardamom plantations or alongwith other types of plantations. Three systems of management are followed for cardamom cultivation. They are (1) The Coorg Malai or Male system which is followed in Coorg, (2) The North Kanara system followed in North Kanara and



Shimoga districts, and (3) the Southern or Mysore system followed in Kerala, Madras and some parts of Coorg and Mysore.

#### THE MALAI OR MALE SYSTEM

This involves clearing of small areas of ever-green forests normally in plots of about  $\frac{1}{4}$  acre which is then planted with cardamom. These plots are selected such that they have north or north-east facing so that adequate side-shade is available from surrounding trees. The "Malabar" variety in one form or other is generally planted under this system. The planting is through seedlings raised in nurseries or from natural regeneration planted with a spacing of about 5 ft. to 7 ft.

These plantations run for about 15 years after initial planting and thereafter are allowed to revert to jungle. A similar system has been followed by the Madras Forest Department which collects cardamom as a minor forest product; this is being achieved by taking advantage of the natural invasion of cardamom in the gaps created by selection fellings.

#### THE NORTH KANARA SYSTEM

In this system cardamom is grown as a subsidiary crop in Arecanut or pepper plantations. The variety of cardamom grown resembles "Malabar" cardamom but the capsules are ovoid and three angled instead of being round. The seedlings for such plantations are normally developed in nurseries and planting is in rows which are 5 ft. to



6 ft. apart.

### THE SOUTHERN OR MYSORE SYSTEM

Most of India's commercial production of cardamom is by this system and estimates by the Directorate of Marketing and Inspection, Government of India indicate that about 90 per cent of commercially produced cardamom is from this type of plantation. This consists in clearing selected areas of jungle land of all undergrowth, thinning out overhead shades and planting of seedlings at regular distances. In the Mysore State cardamom is planted mostly on the margins of ravines while the major areas of the hill slopes are used for coffee.

### CULTIVATION IN OTHER COUNTRIES

In Ceylon, cardamom is grown in small holdings along with other plantation crops. In Guatemala, cardamom is grown on a plantation scale; 95 per cent of total production here is controlled by one planter.

### HARVESTING OF CARDAMOM

The harvesting of cardamom in India begins in the third or fourth year after planting and until the eighth year the crop is good. Picking continues till the 15th year. Thereafter the plant is discarded. The harvesting in India takes place in February-March and August-September and several pickings are necessary in this period. The cardamom capsules which are gathered are dried in the sun or artificially in kilns.



Great importance is attached by the trade to the colour of the cardamom and certain markets require green cardamom while others prefer bleached cardamom. The small green cardamoms like the Alleppey green are most suited for distillation and are priced very high, while the bleached cardamom is used in mixed spices for pickling purposes and for food preparations.

### PROCESSING

After the drying process cardamom is cleaned by rubbing by hand so as to remove remnants of parts of the flower sticking to the capsule. After cleaning, the cardamom is graded according to size and colour in preparation for the market.

Cardamom capsules which do not have a uniform colour have less value in the market and hence these are put through a bleaching process to get a uniform colour. Bleaching has been developed into a highly scientific and paying proposition in Sweden. In India bleaching is done at Haveri, Saklespur and Mudigere in Mysore State.

Bleaching of cardamom leads to a loss of the green colour and the appearance of the cardamom capsule undergoes substantial change. The bleached cardamom is sold as "whole" cardamom in bottles in the U.S.A. and is preferred by the housewife because it has a clean and white appearance. Bleached cardamom also loses its flavour and in general is not as good on chemical characteristics as



unleached cardamom. But, yet there is a particular preference for this in the U.S.A. because of the reason mentioned earlier. In the U.S.A. powdered cardamom is mainly made from green cardamom.

### YIELD RATE

The yield per hectare in India is not at all encouraging and the following table indicates the wide disparity that exists with regard to yield in India and Ceylon.

#### YIELD PER HECTARE -- INDIA AND CEYLON

Year	Yield per hectare (Kg.)	
	India	Ceylon
1960	59	362
1961	59	292
1962	62	306
1963	75	366
1964	40	361
1965	27	390
1966	37	278

Note: The table has been computed from data presented in Table 1.

The yield per acre varies considerably within India between districts and over years. The yield per hectare which was already low in India (75 Kg. per hectare in 1963) fell to 27 Kg. per hectare in 1965 with a slight recovery in 1966 to 37 Kg.

The high yield in Ceylon is related to the fertility of the soil and also the good weather conditions and rain-



fall. Diseases have also not had any bad effect on production in Ceylon plantations.

This wide disparity in the yield per hectare shown by statistics should be studied against the fact that statistics relating to total area under cultivation of cardamom in India is not very accurate. Statistics which were obtained from the FAO at Rome also seem to be far out on area statistics and hence for this study we have accepted figures published by the Commonwealth Secretariat (Commodities Division), London. Therefore, it is essential that a detailed survey be made to assess the actual area under cardamom cultivation in the country. At the moment the State Governments have commenced registration of cardamom planters obtaining details of acreage and production, but this registration has not made much progress as indicated earlier in this section. Possibly, this work could be assigned to the Cardamom Board.

Notwithstanding these differences in statistics, it is still to be noted that the yield per hectare in India is not high enough in comparison with other producer countries, particularly Ceylon for which data is available. There is an indication that the yield per hectare in Guatemala is also very high because of the fact that Guatemala cardamom is able to sell at a lower price.



## COST OF PRODUCTION OF CARDAMOM IN INDIA

A field survey was conducted with the help of a prepared questionnaire to obtain details of cost of production. A total of 40 producers of cardamom were interviewed in Mysore (18), Kerala (14) and Madras (8) States. Data related to three of these interviews could not be utilised in final tabulations as they were deficient in production data, and these were the interviews with growers in Madras State.

A total land-holding in the 40 farms contacted is 2,544.04 acres. The annual acreage, total production and yield per acre for these farms are as follows:

S. No.	Description	1964-65	1965-66	1966-67	Annual averages for 3 yrs.
1.	Annual acreage (Acres)	1504.79	1878.79	2394.04	1925.87
2.	Annual production (Kgs.)	20603.00	28401.70	32289.95	27098.22
3.	Yield per acre (Kgs.)	13.69	15.11	13.48	14.09

To obtain cost of production of cardamom three computations were done (Table 3). The first method covered the entire sample of 37 irrespective of size of land-holding; the second analysis relates to 25 farms each having an acreage below 50 acres; while the third analysis relates to 12 farms each having an acreage above 50 acres.



The life of cardamom plants in Mysore State is estimated to be about 14-15 years whereas in Kerala and Madras the life span is only about 10 years. Possibly the short span of life of the plant in Madras is responsible for the higher yield per acre obtained in this State.

To assess the cost of production all the different operations relating to pre-and post-cultivation have been taken into account.

There are five distinct stages of operation employed by the cardamom cultivators. These five stages may be classified into two broad heads, namely, (i) Pre-cultivation, and (ii) Post-cultivation.

#### (i) Pre-cultivation

The following operations come under this category - (i) clearing of jungles, (ii) preparation of grounds (iii) digging pits, (iv) planting of seedlings. The major portion of the cost of cultivation is spent during the first and second year of cultivation to establish the crop. In all the regions the crop comes into bearing only after the third year of the cultivation.

Hence, the cost incurred for the first two years has to be allocated for the rest of the period of the crop as "Establishment Cost" to assess the total cost of production.

#### (ii) Post-cultivation

There are several distinct operations which are performed by the growers during the post-cultivation period

till the commodity is available for sale in the markets. These operations are mainly (i) harvesting, (ii) weeding, (iii) curing and (iv) plant protection.

Weeding operations are adopted only when the preparatory work on cultivation is completed. Two weedings are made during a year. "Curing" is an essential operation on which expenditure is incurred every year. The cost for plant protection includes the expenditure on inputs like manure and chemicals, and spraying charges. The total cost of cultivation specified in the assessment of cost of production includes the expenditure on all the above items and on harvesting.

The total cost of production of cardamom is arrived at by including "land tax" and "establishment charges" to the cost of cultivation.

The land tax currently levied by the Mysore Government is Rs.2 per acre plus 5 per cent surcharge and by the Madras Government - Rs.11 to Rs.16.50 per acre. Taking the cardamom producing area as an entity the imposition of land tax is about Rs.3.30 per acre.

As regards the "Establishment Cost" no satisfactory information and data are available. This, has however, to be taken into account to obtain the actual cost of production with reasonable accuracy for which at least a percentage of expenses must be loaded to the cost of production.



To carry on trade activities expenditure like general administrative expenses, office establishment, maintenance of livestock, expenditure on tools and implements are essential. Moreover every organization engaged in this trade must have working capital and expects a reasonable return for supervision etc.

In the absence of available data relating to (i) Establishment cost, (ii) Administration charges, (iii) Depreciation, livestock, tools and implements and others, a flat rate of 50 percent over the total cost of cultivation has been assumed as "Establishment charges".

### (iii) The Cost Estimates

The Marketing Research Corporation's survey conducted in March-April 1968 gives the following cost of production of cardamom:

- |     |   |                  |
|-----|---|------------------|
| (1) | Based on interviews with 25 farms each with less than 50 acres                            | Rs.19.63 per kg. |
| (2) | Based on interviews with 12 farms each with more than 50 acres                            | Rs.31.71 per kg. |
| (3) | Based on interviews with 37 farms irrespective of size of area under cardamom cultivation | Rs.25.22 per kg. |

The production of cardamom in the above three categories of farm groups is 15.60 Kg. per acre, 11.02 Kgs. per acre and 12.70 Kgs. per acre respectively.

## THE PROBLEMS RELATED TO THE PRODUCTION OF CARDAMOM IN INDIA

The principal problem facing Indian cardamom growers is of increasing productivity rather than of increasing the area of cultivation. Various factors are at play which are combining to bring down the yield per hectare.

### (a) Ownership of Land

One of these factors is the uncertainty about ownership of land. Under existing Government rules revenue lands are given to cultivators on lease for 20 years with facility for renewing it thereafter; forest lands are auctioned for leases of 20 to 25 years. There is thus some element of uncertainty about future ownership after the expiry of the lease. The cultivator is not very happy about this situation and does not put his best efforts to increase productivity particularly when the period of expiry of lease comes near.

The Cardamom Board has been pressed with this problem and the Seminar conducted by the Indian Institute of Foreign Trade in April 1967 has also highlighted this factor affecting production. The Cardamom Board is pursuing the matter with the Government to arrange for the granting of "Patta" or perpetual lease in respect of both revenue and reserved forest land allotted to the cardamom planters.

### (b) Deforestation

Indiscriminate deforestation in and around cardamom growing areas has exposed cardamom plantations to the



ravages of heavy winds and increasing attack of pests and diseases. The State Forest Departments have been moved in this matter by the Cardamom Board to formulate a forest policy keeping in view the healthy growth of the cardamom industry.

(c) Inputs and Methods of Irrigation

Inputs, particularly fertilizers and irrigational methods have a strong bearing on the yield. The system of sprinkler irrigation is one of the most effective means of raising per hectare yield. The Seminar conducted by the IIFT has suggested that the Cardamom Board should come to the aid of the planters by arranging hire purchase of sprinkler equipments and spares etc. needed for the purpose.

(d) Dissemination of Research Findings

The research stations located within India have conducted substantial research on cardamom. However, the extension service to disseminate the findings of these studies have not been very effective in bringing to the planters a full knowledge of all the new methods necessary to increase yield per hectare.

(e) Diseases

Areas affected by mosaic (Katte) disease are said to yield about 9 to 10 Kgs. per acre only, whereas the unaffected areas yield about 90 to 135 Kgs. per acre. Because of this, there has been, in many cases, a shift from cardamom crop to coffee and other more suitable

products in areas where this disease has affected cultivation. Research has proved that the best method for systematic eradication of this disease is as follows:

- (i) The area under cardamom plantations should be divided into convenient blocks in which all the eradication measures should be carried out at one time.
- (ii) Each cardamom bush in the block should be carefully examined and those which may be infected or become old, should be destroyed.
- (iii) The condemned bushes should be dug out, heaped and burnt. This operation should be so regulated that no dug-out bush is left undisposed in the gardens after the day's work is completed. This is essential in order to prevent the migration of infectious aphids from the diseased cardamom bushes to the healthy ones.
- (iv) Regular survey of the plantation for infected cardamom plants and the surrounding areas for the wild Ammomum SPP which act as collateral hosts of the virus should be carried out and any diseased plant that may be observed should be rogued out and destroyed.
- (v) The area then should be replanted with healthy cardamom seedlings raised from seed in isolation.
- (vi) Ban on movement of planting materials such as rhizomes or seedlings from adjoining areas must be rigidly enforced.
- (vii) The plantation may be sprayed occasionally with systematic insecticides as a prophylactic measure.



WAREHOUSING OF SPICES IN INDIA

Most of the spices are highly susceptible in storage to attacks by insects, mites, moisture and rodents.

The scientific storage and cheap credit facilities provided by Central and State Warehousing Corporations are attracting sizeable quantities of spices into warehouses. In Central Warehouses alone over 1936, 2987 and 3248 metric tonnes of spices were deposited during 1961-62, 1962-63 and 1963-64 respectively. In State Warehousing Corporation Warehouses spices deposited during the same period are over twice the quantity stored in Central Warehouses.

## II - PRODUCERS AND THEIR MARKETS: 1957 - 1967

### THE MAIN PRODUCERS OF CARDAMOM

India, Ceylon, Guatemala and Thailand are the major producers of cardamom in the world. Cardamom is also produced in small quantities in Laos, Vietnam, Costa Rica, El Salvador and Tanzania. It is contemplated that none of these minor producers would be able to stand as competitors in the world market even after 1975-76.

The total world production averages only 5100 tonnes per annum for the 11-year period 1956-66, and in 1967, production is estimated at about 5080 tonnes with an incredible figure of 1750 tonnes for Ceylon.

### PRODUCTION IN INDIA AND THE WORLD

#### INDIA

India still occupies the most prominent place in the world in respect of cardamom production. Regarding the world production, no reliable estimates were available over a period of time. However, the Report on the Marketing and Trade in the countries of E.C.A.F.E. region published in 1959 has estimated the world production (excluding Central American Countries whose production of cardamom was negligible in early fifties) at about 1778 tonnes of which India's share was 85.7 per cent (or 1523 tonnes) followed by Ceylon and Thailand each contributing about 8.7 and 5.6 per cent respectively. In recent years India's share in the world production has declined to 49% in 1965



and 56 per cent in 1966 as a result of increased output in Guatemala and the drop in production within the country.

The table given below presents the world production of cardamom and India's share in it. Table 4 presents the annual production in Ceylon, Guatemala and Thailand during 1951-1966.

WORLD PRODUCTION OF CARDAMOM AND INDIA'S SHARE

Year	Production ('000 tonnes)		India's share (%)
	World	India	
1960	5.4	3.3	61
1961	4.7	3.2	68
1962	5.4	3.4	62
1963	6.1	4.1	67
1964	4.1	2.2	54
1965	4.1	2.0	49
1966	4.8	2.7	56

Indian cardamom constituted nearly 59 per cent of world production during the period 1956-1966. The average annual production of Indian cardamom during this period works out to 3000 tonnes while it is only 2100 tonnes for all the other major producers put together.

The peak year of production in India was 1963 with the output of 4100 tonnes of cardamom as against the leanest year 1965 when only 2000 tonnes was produced. The steep fall in production recorded during 1965 was largely due to the incidence of the plant disease 'Katte' which brought havoc in the plantations and also drought conditions.

After 1965 there was a slight recovery in the output due to the programme of 'rouging' of infected plants' which helped, to some extent, to counteract the impact of 'Katte' disease.

#### PRODUCTION IN CEYLON

Next to India, Ceylon is the largest producer of cardamom in the world. Her annual production was below 1000 tonnes till 1954 and thereafter (between 1955 to 1958) it was in the range of 2200 to 2500 tonnes. After 1959, her annual output has never reached beyond 1700 tonnes. The reasons for such a steep fall are not known. Production in 1966 was of the order of 1500 tonnes only.

The plantations in Ceylon are mostly in the form of small holdings where cardamom is grown with other plantation crops. Data regarding the cost of production of cardamom are not available.

#### PRODUCTION IN GUATEMALA

Compared to India and Ceylon, Guatemala is not a big producer of cardamom. As the local consumption is insignificant, her total exports were taken as her production. During the period 1951-1959, her exports were not more than 150 tonnes in any one year. A sudden jump in exports in 1960 shows that production of cardamom in Guatemala increased to around 400 tonnes in that year. Thereafter, but for a minor decline in 1961, exports have regularly been maintained annually at around 400 tonnes.



indicating the production has stabilized at around this figure.

Cardamom is grown on plantation scale in Guatemala and one firm - Monte de Oro - controls 95 per cent of production in the country. Details regarding the cost of production are not available but it is generally believed that it is not very heavy as it is reflected in the prices quoted by the firm particularly in the West European markets.

Plantations in Guatemala are quite young in age. It is the general impression that normally after the sixth year of plantation, cardamom plants are attacked by diseases. On this basis it is believed that the present cardamom plantations in Guatemala are now becoming susceptible to diseases, because there was an additional production of about 250 tonnes of cardamom in 1960 due probably, to cardamom planted around 1957. These plants have now reached the age of over 10 years (7th year of bearing) and are at an age when they are liable to attacks of diseases.

Because of the above factors, future production of cardamom in Guatemala is estimated to be in the region of not more than 450 tonnes per annum unless substantially new areas are brought under cardamom cultivation. However, there are no reports of this having taken place in Guatemala. The quantum of future production in this country is, therefore, not likely to deviate much from the present level.

### PRODUCTION IN THAILAND

Thailand also produces cardamom but in small quantities - about 100 to 200 tonnes of cardamom per year since 1958 (data obtained through export figures).

Earlier to this, production was slightly higher in particular years and the peak production was in 1951. However, the annual production was averaged at 400 tonnes roughly during this period (1951-'57).

### SUPERIORITY OF INDIAN CARDAMOM

Indian cardamom tops in quality and occupies a unique position in the world market. It is superior in its inherent characteristics such as flavour and aroma. Even though Ceylon produces more than 1600 tonnes annually, she is not able to stand as a potential rival to India. It is mainly because cardamom produced in Ceylon is not very good in quality as compared to Indian variety. Most of the Middle East countries (the important markets for cardamom) visited do not show any preference for Ceylon cardamom while in the same markets there is a marked preference for Indian variety.

Cardamom produced in Thailand is also not as good as Indian cardamom. But, Guatemala cardamom offers resistance to Indian cardamom especially in Middle East zone. Even though Indian cardamom is far superior in quality to Guatemala cardamom, it does not match well with Guatemala cardamom in external appearance particularly in colour and



its uniformity in size and shape. However, the traditional markets for Indian cardamom show more preference for the quality of Indian variety than the ones from Guatemala. It is because of quality that India still has a floor even in far away markets like the U.S.A., the U.K. and Sweden. This shows India has a quality 'premium'.

#### THE PRINCIPAL MARKETS FOR THE PRODUCER COUNTRIES

The world export trade in cardamom is in the range of 2000 to 3000 tonnes per year (Table 5). As can be seen from the table given below India is dominating this world trade always having a major share of more than 66 per cent.

#### WORLD EXPORTS OF CARDAMOM AND INDIA'S SHARE

Year	World Exports (('000 tonnes)	India's Exports (('000 tonnes)	India's share in World Exports(%)
1960	2.6	1.9	75
1961	2.8	2.3	82
1962	3.1	2.4	77
1963	2.7	2.1	78
1964	2.9	2.1	74
1965	2.1	1.4	66
1966	2.2	1.5	67
1967	2.3	1.6	68

#### THE MIDDLE EAST - A COMMON MARKET

The Middle East including the States of Saudi Arabia, Kuwait, Bahrain, Qatar, Trucial Oman, Muscat and Aden constitute the major markets for the principal producers of cardamom. During the period 1960 to 1966, nearly 48 per cent

of India's exports were directed to this region; in the same period, between 30 to 50 per cent of Ceylon's exports of cardamom went to these countries. This region is also an important market for Guatemala cardamom and during the period 1963 to 1967 a quarter to a third of total exports from Guatemala were to this region. This indicates the importance of the "Middle East" as a major consumer market for cardamom more particularly for Indian cardamom.

The following table presents the share of exports directed to Middle East from each of the major producing countries.

EXPORTS TO THE MIDDLE EAST AS PER CENT OF  
TOTAL EXPORTS OF CARDAMOM FROM PRODUCER  
COUNTRIES

Countires	1960	1961	1962	1963	1964	1965	1966	1967
India	49.8	44.3	45.2	47.8	45.6	47.7	47.6	64.6
Guatemala	N.A.	N.A.	N.A.	24.4	34.9	33.2	28.2	29.1*
Ceylon	49.9	37.4	38.7	45.1	25.9	41.1	33.8	37.5

\*January to May.

In the peak year of world production of cardamom (i.e. in 1963) the imports of cardamom into Middle East countries were of the order of about 1200 tonnes which have gradually declined to 844 tonnes in 1966. During 1967, the imports went up again to the level of 1158 tonnes. As can be seen from the following table a major supply (about 80 to 88%) to these countries originates



and Ceylon (about 4 to 7 per cent).

TOTAL IMPORTS OF CARDAMOM INTO 'MIDDLE EAST'

1963-1967

Year	Source of Import			(Tonnes)
	India	Ceylon	Guatemala	Total
1963	1038 (86.6)	70 (5.8)	91 (7.6)	1199 (100)
1964	977 (84.9)	37 (3.2)	137 (11.9)	1151 (100)
1965	639 (76.1)	59 (7.0)	142 (16.9)	840 (100)
1966	676 (80.1)	43 (5.1)	125 (14.8)	844 (100)
1967	1015 (87.6)	47 (4.1)	96 (8.3)	1158 (100)

OTHER MARKETS FOR CEYLON CARDAMOM

In addition to the Middle East countries mentioned above, Ceylon depends heavily on Jordan to which nearly 30 per cent of Ceylon's exports of cardamom are directed annually. The third major market for Ceylon cardamom is Lebanon which shares about five to seven per cent. Ceylon does not figure in the European markets, but exports to the U.S.A. About three to six per cent of her cardamom exported reaches the U.S.A. markets every year.

OTHER MARKETS FOR GUATEMALA CARDAMOM

Besides Middle East markets, Guatemala exports substantial quantity of cardamom to Sweden which shares about 22 to 30 per cent of Guatemala's exports of cardamom.

Exports from Guatemala to Scandinavian and European countries, mainly Finland and West Germany are also high - about 10 per cent to Finland and 10 to 18 per cent to West Germany. The U.S.A. offers a good market for Guatemala cardamom. Her annual offtake was of the order of about 10 to 17 per cent of the total cardamom exports from Guatemala. During the period January-May 1967 nearly 26 per cent of the exports of Guatemala cardamom went to the U.S.A.

#### MARKETS FOR THAI CARDAMOM

Exports of cardamom from Thailand are mostly directed through Hong Kong and Singapore. As referred to earlier, due to her inability to increase her production, Thailand does not figure as a competitor for Indian cardamom. Moreover, it is believed that the marketing costs and freight charges of Thailand cardamom are higher resulting in higher selling price in the overseas markets.

The picture of the importance of different markets to different producer countries indicates that the Middle East by far is the most important area of export and the highest preference must be given to this market particularly because the price paid here is in general higher than elsewhere in the world. This does not mean to say that other markets are not important. The Scandinavian market is of special significance to India. As India has lost ground here, particularly in Sweden during the last few years, there is need for her to regain this market lost to Guatemala.



THE PER CAPITA CONSUMPTION OF CARDAMOM IN MAJOR  
IMPORTING COUNTRIES

The highest per capita consumption of cardamom of 72 grams per head per year is in the Middle East region (Tropical Products Quarterly, March 1968) - Table 13. The per capita consumption in this region has remained very high from 1957 onwards when consumption of cardamom is first recorded for this region.

Sweden is next on per capita consumption of cardamom where during 1961-63 the per capita consumption was 40.73 grams. This high consumption rate fell during the period 1963-66 to 34.51 grams per head per year.

Finland, another Scandinavian country, also has a high per capita consumption of cardamom. It was 26.33 grams per head per year during 1963-66. The other countries have substantial per capita consumption are Norway - 9.64 grams, Denmark - 6.99 grams, Iran - 1.48 grams and West Germany - 1.19 grams.

The study of the pattern of per capita consumption indicates that peak per capita consumption was attained in the 1961-63 period when most of the countries showed the highest per capita consumption.

### III - PATTERN OF EXPORTS OF INDIAN CARDAMOM

#### TRENDS OF EXPORTS

From an average export of 504 tonnes valued at 1.7 million per year for the period 1930-31 to 1934-35 India's exports of cardamom reached an average of 2136 tonnes valued at Rs.31.9 million in the period 1960-61 to 1964-65. The following table shows that but for the periods, 1940-41 to 1944-45, 1950-51 to 1954-55 when exports fell marginally, there has been a gradual increase in the quantity and value of cardamom exports.

#### THE HISTORICAL PATTERN OF INDIA'S EXPORTS OF CARDAMOM

S. No.	Period	Quantity in Tonnes	Value in million rupees	Value per tonne Rs.
1.	1930-31 to 1934-35	504	1.7	3373
2.	1935-36 to 1939-40	642	2.4	3738
3.	1940-41 to 1944-45	443	2.3	5192
4.	1945-46 to 1949-50	859	7.0	8149
5.	1950-51 to 1954-55	842	15.5	18408
6.	1955-56 to 1959-60	1394	28.5	20445
7.	1960-61 to 1964-65	2136	31.9	14934

The past pattern of exports indicates that between 1950-51 to 1954-55 and 1960-61 to 1964-65 there has been a 154 per cent increase in quantity and 106 per cent increase in value of cardamom exports; in the earlier decade (1940-41 to 1944-45 and 1950-51 to 1954-55) the increase was 90 per cent and 574 per cent respectively.



There is thus a rising trend for exports of cardamom both in terms of quantity and value.

### THE DIRECTION OF EXPORTS

The direction of India's exports of cardamom has changed remarkably from what it was in the 1930's. The European continent, the U.K. and the U.S.A. constituted 69 per cent of India's market for its cardamom in the period 1930-31 to 1934-35; in the period 1960-61 to 1964-65 it took up only about 22 per cent of the total exports.

The shift in the direction of trade took place in the period 1940-41 to 1944-45 when the Middle East countries commenced import of Indian cardamom; in that period about 38 per cent of India's exports went to three countries - Kuwait, Bahrain and Saudi Arabia in this region. The Middle East continues to be the major buyer for India's cardamom and in the period 1960-61 to 1964-65 also about 40 per cent of exports were to these three countries.

The principal reasons for this shift is the higher price that this market is willing to pay coupled with the nearness of the market. The affluence in these Arab States of the Middle East consequent upon the discovery of oil in the area is largely responsible for the capacity of these countries to pay higher prices for Indian cardamom. So long as oil continues to be found in these

countries and the purchasing power remains high, Indian cardamom would find a ready market here.

An analysis of the export data for the last three years, 1965-66, 1966-67 and 1967-68 (11 months) (Table 6) indicates that the direction of exports is shifting among the lower buyers. The top two purchasing countries in all these years are Kuwait and Saudi Arabia: their share of total exports was 44.9 per cent in 1965-66, 44.0 per cent in 1966-67 and 54.1 per cent in 1967-68 (11 months).

The U.S.S.R. is emerging as an important buyer of Indian cardamom; its share in total exports has risen from 2.6 per cent in 1965-66 to 6.3 per cent in 1966-67 and 7.1 per cent in 1967-68 (11 months).

A significant point that is noted with respect to India's exports of cardamom during the eleven months, April 1967 to February 1968, is that the Middle East market has taken up nearly 63 per cent of India's exports during this period.

#### EXPORTS OF CARDAMOM - TYPEWISE

An analysis of the typewise exports of cardamom from India shows that "small" cardamom occupies the major share in total exports. Table 7 gives details of typewise exports in the period 1964-65 to 1966-67.

In terms of quantity Alleppey Green small cardamom has increased its share in total exports from 54 per cent (948 tonnes) in 1964-65 to nearly 72 per cent (1231 tonnes)



of total exports in 1966-67. By value also the corresponding figures for the two years are 64 per cent and 76 per cent.

Exports of large cardamom declined in 1966-67 to only 132 tonnes (7.7 per cent of total exports) as against 257 tonnes (between 15 and 18 per cent) in each of the previous two years..

Small cardamom meant for bleaching or which has already been bleached constituted about 8 per cent (138 tonnes) of total exports and contributed to about 9 per cent (Rs.2.5 million) of the total value of exports in 1964-65. The share of this type in total exports came down in 1966-67 to 5 per cent (91 tonnes) in terms of quantity and 6 per cent (Rs.4.4 million) in terms of value.

There is a reduction in the exports of cardamom small seeds over the last three years, from 117 tonnes (7 per cent of total exports) in 1964-65 to 83 tonnes (15 per cent of total exports) in 1966-67. However in terms of value this type maintained its share at about 7 per cent of total value of exports.

#### MARKET FOR DIFFERENT TYPES OF CARDAMOM

Alleppey Green small cardamom is exported in substantial quantities to the Middle East, of which Saudi Arabia and Kuwait are the major buyers; exports to these countries of this type of cardamom in 1966-67 totalled



720 tonnes valued at Rs.37.4 million (Table 8). The other buyers of this type of cardamom in 1966-67 were U.S.S.R. (86 tonnes), Sweden (64 tonnes) and Finland (31 tonnes).

Sweden and U.S.S.R. are the two major buyers of Coorg Green small cardamom and exports to these countries were 29 tonnes and 21 tonnes respectively in 1966-67.

India exported about 11 tonnes each of this type to Afghanistan and Japan in 1966-67 valued at around Rs.0.5 million each (Table 11).

"Large" cardamom which is grown mainly in West Bengal and Assam is exported largely to Afghanistan, Malaysia and Singapore and the U.K. (Table 9). In the year 1966-67, 66 tonnes of cardamom was exported to Afghanistan valued at Rs.0.9 million and 34 tonnes valued at Rs.0.4 million to Malaysia and Singapore.

Small cardamom bleached or capable of being bleached is exported to Iran, Malaysia and Singapore, U.K., Sweden and Finland. A total of 91 tonnes of this type was exported in 1966-67 of which 21 tonnes went to Iran and nearly 17 tonnes to Malaysia and Singapore, 8 tonnes to U.K. and 7 tonnes to Sweden (Table 10).

About 83 tonnes (value Rs.5.4 million) of cardamom small seeds were exported in 1966-67 as against 117 tonnes (value Rs.2.1 million) in 1964-65. The three major countries importing small seeds are East Germany, Finland and Sweden (Table 12). About 24 tonnes were exported to each of the former two while 15 tonnes were exported to



Sweden.

### THE STRUCTURE OF PRICES

The price varies on supply and demand. Cardamom is largely sold in bulk i.e. ungraded at auctions to exporters. Depending on the colour, size of the capsules, weight (which is invariably assessed by the merchants by holding the cardamom in their palms) and the quantity put up for sale at the auction centres, the price is determined. The cardamom is sold in open auction and the highest bidder gets the lot.

The average price secured for Alleppey cardamom at the auction centres during the current season is about Rs.45 per Kg. and for the Coorg cardamom about Rs.40 per Kg.

The merchants grade the cardamom according to the specifications of the importers or on the basis of certain samples. The Agricultural Marketing Adviser assigns a particular grade specification and the prices for the same grade specification varies from dealer to dealer.

Table 14 gives the wholesale prices of small cardamom at Alleppey. The wholesale prices per quintal which was Rs.2411.46 in March 1957 rose to Rs.6700.00 in March 1966; it was Rs.5600.00 per quintal in March 1967. There has been marked fluctuations in wholesale prices dependent mostly on the pattern of production in the country. In the year 1963 when there was maximum production, the wholesale price was Rs.1500/- per quintal.

## A COMPARISON OF LOCAL AND EXPORT PRICES

Table 15 presents prices of "extra green", "medium" and "ordinary green" cardamom prices at Bodinayakanur and Bombay and F.O.B. prices of Indian exports. The table also deals with London spot prices for Alleppey Green and Ceylon Green cardamom.

A study of the prices within India and the F.O.B. prices indicates that the average F.O.B. prices in general is lower than the local price excepting in some cases. In general the Indian price follows the pattern set by international prices.

A study of London spot prices of Alleppey green and Coorg green shows that Alleppey green is selling at a lower price than Coorg green from November 1966 till August 1967.

## PACKAGING OF CARDAMOM FOR EXPORT

Cardamom is generally packed in two ways depending upon the requirements of the importing country.

In the first type of packaging cardamom capsules are packed in nylon bags and then covered over by gunny. This entire package is shaped in the form of "Mooda" (round shape). The mooda is then covered by hessian cloth and tied with coir rope. The entire packaging is given a tar (Bitumen) plastering giving it a black colour. This plastering is said to be necessary to retain



the green colour of cardamom. Exports to Kuwait are mostly of this type of packages. Originally packages were of 50 Kgs. weight but now 25 Kgs. packages are also supplied.

In the second method of packaging, cardamom capsules are placed in nylon bags covered with gunny and contained in wooden cases; normal weight measures are 10 to 25 Kgs. The wooden case is also tar plastered on the outside. This method of packaging is used for export to other Middle East countries.

During the field survey, particularly at Bahrain, it was mentioned that Indian packing cases are not strong enough to stand the strain of transportation as compared to Guatemala cases. The Guatemala cardamom is packed in thick polythene bags and placed in strong wooden cases bound by steel strips. They are sold in sizes varying from 12.5 Kg. to 50 Kg. Bahrain receives it in 12.5 Kg. sizes while Aden and Jeddah get the larger sizes.

#### TRANSPORTATION PROBLEM

The exporters in the South Western coast of India contend that they are not provided with sufficient shipping facilities to make direct exports to the Middle East. Their trade currently depends mainly on transshipment from Scindia Steamer Service at Bombay. The transshipment charges at Bombay are said to be very high (minimum of Rs.60/- for 5 cases) and even when goods are booked and reserved particularly from Mangalore, Scindia ships do not



carry them as they come fully loaded from Cochin. This is causing hardships to exporters from Managalore.

Calicut exporters also indicate that the availability of steamers for the Middle East is a real problem with them and there is a suggestion from them that the Moghal Line Steamers which run a regular service from India to the Red Sea ports should be made to call at Cochin.

Currently, the freight rate from Bombay to the Middle East is less than that from Southern ports to the Middle East. The trade desires that this should be corrected - possibly this can only be done if direct steamer service to the Middle East is made possible from Southern ports.

#### CARDAMOM OIL

Out of about 2,000 tonnes of cardamom exported from India, about 600 tonnes reach Western countries, which distil a major portion of it. Figures are not available for the World production of Cardamom oil. It would be safe to assume that at least 300 tonnes of Indian cardamom are distilled for the oil excluding Guatemala and other cardamoms. This would yield, on an average about 20,000 kgs. of oil. The current price for the oil is about Rs.1500/- per kg. Thus the output of this industry would be worth 30 million rupees per annum.

In India, the production of oil is very limited. One or two foreign firms distil oil to export to their parent firms abroad. But, since foreign distilled oil



fetches higher price than Indian distilled oil, this is done only to a limited extent. There are a few Indian firms who have been making cardamom oil, along with some of the other essential oils.

Because of good scope for developing this industry in India and the willingness of the major planters to undertake oil extraction from lower grade cardamom, the Central Food Technological Research Institute conducted research towards studying the technology of distillation of cardamom.

The CFTRI has established optimum conditions for economic recovery of good quality oil and a design of a commercial still capable of distilling 30-40 Kgs. of seeds per batch is ready. This is based on engineering data gathered from a pilot still being worked at present. After fabrication and testing, the commercial still design is expected to be made available to interested parties.

Cheaper grade materials like thrip-marked and splits are as good as whole cardamom for distillation.

Of the three varieties of cardamom — Coorg greens, Saklespur bleached and Alleppey greens, the last named gives a higher percentage of oil.

	Yield of oil on seeds	
	v/w	%
Coorg greens	6	- 7
Saklespur bleached	6	- 7
Alleppey greens	8	- 10

Husk weight averages 25 - 30% on whole pods.

QUALITY OF OIL

If the distillation is done under the proper conditions, a colourless oil with the pleasant odour of cardamom results.

The flavour of the oils from Alleppey greens and Coorg greens differ to a marked extent. This is due to a difference in their chemical composition. The Alleppey greens oil has a mild sweet odour due to the presence of linalool and linalyl acetate to the extent of about 10 per cent. In Coorg oil these are less and 1-8-Cineole is predominant (40 per cent); so the oil has a harsher camphoraceous odour. It may be advantageous to blend the oils suitably for commercial purpose. Properly stored, the oil keeps good for a fairly long time (1-2 years). Some storage studies are also going on at CFTRI.



#### IV - TARGETS FOR EXPORTS IN 1970-71 & 1975-76

##### TREND OF WORLD TRADE

The pattern of trade in cardamom atleast over the last three years indicates that there was a substantial shortfall in supply as related to world demand. World exports of cardamom were at the peak of 3100 tonnes in 1962 which fell to 2898 tonnes in 1964 and gradually declined to 2300 tonnes in 1967. The downward trend shown in exports was attributed mainly to the shortfall in production in major producing countries which can be seen in Table No.16 in the Appendix. World production of cardamom was in the range of 5100 tonnes to 5800 tonnes with an annual average of 5400 tonnes in the period 1956 to 1960. In the next six years (from 1961-66) the annual average production dropped to 4900 tonnes which was caused mainly by the steep fall in out-put during 1964 and 1965. The fluctuations noticed in the output highly correlated with the trend of Indian production since Indian cardamom constitutes on an average more than 58 per cent of the world output.

##### LEVELS OF CONSUMPTION

The rapid growth of G.N.P. plays a vital role in the consumption pattern of costlier spices such as cardamom, pepper etc. The higher growth rates achieved by the major cardamom consuming countries such as Sweden, Kuwait, Saudi Arabia created a higher demand for cardamom, which in turn



raised the prices of this item as it was in short supply. Thus the unit price of cardamom exports over the last six years has risen substantially from the range between \$1600 or Rs.12,000/- (Ceylon variety) and \$ 2600 or Rs.19,500 per tonne (Indian variety) to \$ 8200 (Rs.61500) and \$ 7100 or Rs.53250 per tonne respectively. While there is a widespread fear that this extremely high price of cardamom is likely to deter consumers from normal purchases yet the price has shown no tendency to come down particularly indicating a shortage in supply, but not a collapse of demand. This is likely to prevail upto 1971 and beyond since cultivation of plants are still lagging and yield takes four years atleast of first planting.

#### EXPORT EARNINGS

Though the exports of cardamom have recorded a fall in quantity in recent years, in value terms there has been a substantial increase in the period 1962-67 which was mainly due to the sharp rise in the prices. While there has to be a physical decline in consumption, the producer countries have earned much more by the export of lesser quantities of cardamom than ever before. This condition is very conducive to increased export earnings especially by India over the next ten years provided safeguards are taken to ensure that the pattern of consumption of cardamom is not allied by prohibitive prices. Currently prices are not prohibitively high.



## INDIA'S POSITION IN THE WORLD MARKET

India occupies a dominant position in the world cardamom market. Her exports of cardamom constitute more than 68 per cent of total world exports in 1967 (67% in 1966). Even with this commanding position there should not be complacency in the industry, because, India has lost a little ground in particular areas of the world market mainly because of the fact that her production has declined and thus the falling yield per hectare has increased the cost of production considerably. It is quite possible for India to accelerate her production and export of cardamom to the level of the year 1963 when her contribution was about 67 per cent towards world production and 78 per cent to world exports. This could be easily achieved by 1970-71 if a determined effort is made to establish higher production by countering the various adverse factors which affect the yield rate.

## MAJOR MARKETS FOR INDIAN CARDAMOM

India's export of cardamom was at maximum of 2310 tonnes in 1963-64 of which about 1130 tonnes (49%) went to Middle East countries, 372 tonnes (16%) to European countries and 154 tonnes (7%) to U.S.S.R. (refer Table 22). The offtake by U.S.A. accounted for only 24 tonnes as against 26 tonnes by Malaysia and Singapore in that year. Middle East countries notably Saudi Arabia, Kuwait and Bahrain provide the largest market for Indian cardamom



in the world followed by European countries especially Sweden.

(1) 'MIDDLE EAST'

As can be seen from the Table given below, Saudi Arabia, the largest consumer of cardamom in the world, imports about 520 tonnes annually (about 75 per cent of which from India alone) during the period 1963-66.

CARDAMOM IMPORTS INTO MIDDLE EAST COUNTRIES

Imported into	1963	1964	1965	1966	1967
<u>SAUDI ARABIA</u>					
From:					
India	542	414	293	295	384
Ceylon	51	30	35	21	30
Guatemala	91	137	142	79	48
	684	581	470	395	462
<u>KUWAIT</u>					
India	323	435	250	287	495
Ceylon	6	6	12	15	13
Guatemala	..	..	..	..	..
	329	441	262	302	508
<u>BAHRAIN</u>					
India	65	33	24	35	49
Ceylon	6	1	4	3	2
Guatemala	..	..	..	46	37
	71	34	28	84	88
<u>OTHER MIDDLE EAST COUNTRIES*</u>					
India	108	95	72	59	87
Ceylon	7	..	8	4	2
Guatemala	..	..	..	..	..
	115	95	80	63	100
<u>TOTAL IMPORTS INTO MIDDLE EAST ZONE</u>					
India	1038	977	639	676	1015
Ceylon	70	37	59	43	47
Guatemala	91	137	142	125	96
	1199	1151	840	844	1158
<u>TOTAL EXPORTS OF CARDAMOM FROM INDIA</u>					
	2126	2138	1352	1466	1557

\*This includes Qatar, Trucial Oman, Muscat, Aden and Yemen.



From 542 tonnes in 1963 Saudi Arabia's import of Indian cardamom has steadily declined to 295 tonnes in 1966.

During 1967 the import went up to 384 tonnes. On the other hand Guatemala has rapidly increased her exports into this country from 91 tonnes in 1963 to 142 tonnes in 1965.

During 1966 and 1967 the exports were suddenly dropped to 79 and 48 tonnes respectively. This was mainly due to the higher prices quoted for Guatemala cardamom. The growth of G.D.P. of Saudi Arabia works out to about 8.9% per annum which maintains a higher demand for cardamom. It is reported that Indian cardamom is becoming more popular in recent years. Cardamom coffee which is extensively used in this country creates a considerable demand for this item.

In Kuwait, India virtually holds the monopolistic position. Her exports to this country rose steeply from 323 tonnes in 1963 to 495 tonnes in 1967 having low levels of exports in 1965 and 1966 (262 tonnes and 302 tonnes respectively). Ceylon, the sole competitor to India in this market was making great efforts and increased her exports to this market from 6 tonnes in 1963 to 15 tonnes in 1966 and 13 tonnes in 1967. However, India is in a strong position to withstand the competition from Ceylon for many years to come.

The demand for cardamom is rapidly increasing in Kuwait along with the growth of her G.N.P. which is currently rising at the rate of about 6 per cent per



annum. Growth of G.N.P. is an important factor which induces those who were already accustomed to the use of cardamom to consume more and more. Thus a higher demand is anticipated in 1970-71 and 1975-76 from Kuwait.

Bahrain Island is the next important market where India held monopoly till 1965. During 1966 Guatemala has stepped in with 46 tonnes as against 35 tonnes from India and shattered the market. However, in 1967 India was forging ahead with 49 tonnes as against 37 tonnes from Guatemala.

On the whole, the Middle East countries offer a strong base for Indian cardamom. Besides, the popular use of cardamom in the preparation of coffee in this region will continue to provide a stable demand particularly in Kuwait, Saudi Arabia, and the Sheikdoms, notwithstanding the attraction of other beverages because increased affluence enables the market for those drinks to grow while not impinging heavily on volume of either coffee or cardamom. This will enable India to remain as the largest single exporter to these countries.

Middle East zone - the largest market for the Indian cardamom imports on an average about 1040 tonnes per annum of which India alone contributes around 870 tonnes sharing about 84 per cent of the total imports of this zone. It is in this major market that Guatemala is now making an inroad and emerging as a potential rival to India. The partial loss of distant markets in the U.S.A. and Sweden



is one thing - competition so close to our shores is another. It is this consideration which points to the need for an aggressive production and sales policy. It is anticipated that the exports of Indian cardamom to Middle East countries are likely to be around 1250 tonnes in 1970-71 and 1450 tonnes in 1975-76.

The Middle East consumer as the field survey amply confirmed does not know the difference between cardamom supplied by different producers. It is the importer who sets the norms of purchase from different countries. In this he is guided to some extent by general preferences shown by the consumers on cardamom bought from different sources. In the final choice Indian cardamom is in general most preferred because of its "essence". However, the price factor and availability of supplies also play a minor role in this market. Ceylon First Grade heavier cardamom, because of its high price is for example at a marked disadvantage. Indian Alleppey Green holds its own at every stage.

The method of marketing of Guatemala cardamom in the Middle East, namely, through sole distributors, one in the Gulf Area (Bahrain) and the other at Aden has given some advantage to India, as the distributor takes in a substantial share of "margin" and is responsible for a higher price for Guatemala cardamom (though lower than Indian cardamom in particular areas). It would be possible



for India to continue to maintain a dominant position in the Middle East market provided cost and quantum of production in India and price are maintained at near or below current levels.

(ii) SWEDEN AND OTHER EUROPEAN COUNTRIES

The Scandanavian and West European markets are now looking towards Guatemala for a major portion of their requirements of cardamom. The principal reason given for this shift is the higher price of Indian cardamom there. Importers in Sweden and West Germany have also indicated that the major supplier of Guatemala cardamom is able to talk across the table and fix prices of cardamom. This has influenced these importers and they find it much more convenient for their dealings - if we had cardamom to supply we could initiate more competition with service there. Indeed, Sweden's firm demand is one which we must pursue as soon as our production expands.

In Sweden cardamom is used largely in confectioneries. The total consumption of cardamom there fell considerably in 1965 when the price of cardamom shot up to high levels because of low production in India. From 300 tonnes in 1962, the imports dropped to 270 in 1965. The imports of cardamom have, however, shown a gradual increase in 1967. The pattern of imports from India and Guatemala into this country shows very clearly the strong competition that India is facing from Guatemala. From 263 tonnes imported



from India in 1962, the quantity fell to 64 tonnes in 1965 and thereafter a gradual recovery has been made; imports totalled 109 tonnes in 1967. As against this, imports from Guatemala have been increasing steadily from 35 tonnes in 1962 to 137 tonnes in 1966. In 1967 there was a slight drop in imports from Guatemala (83 tonnes). The table below indicates the percentage share of India and Guatemala in the total imports of cardamom into Sweden during 1962 to 1967.

IMPORTS INTO SWEDEN

(By Quantity) (Percentages)

Year	Share of Import			Total
	India	Guatemala	Others	
1962	87.7	11.7	0.6	100.0
1963	71.5	27.3	1.2	100.0
1964	66.0	29.2	4.8	100.0
1965	29.5	63.1	7.4	100.0
1966	33.0	61.2	5.8	100.0
1967	41.3	45.1	13.6	100.0

Besides, a higher growth rate of 9.32 per cent per annum in the G.D.P. always keeps Sweden in an advantageous position to maintain a high demand for cardamom. On the basis of this growth it is quite likely that a higher per capita consumption is anticipated in the next few years which places the demand at 240 tonnes in 1970-71 and 300 tonnes in 1975-76.

IMPORTS INTO SWEDEN

(By Value) (Percentages)

Year	India	Guatemala	Others	Total
1962	86.5	12.8	0.7	100.0
1963	70.7	28.4	0.9	100.0
1964	66.2	30.0	3.8	100.0
1965	31.1	61.8	7.1	100.0
1966	36.2	57.6	6.2	100.0
1967	43.5	46.5	10.0	100.0

Unit value of imports of cardamom into Sweden from India and Guatemala are given below. During the last three years (1965-67) unit values of Indian cardamom were higher than that of Guatemala cardamom.

(Unit Value)

('000 Kroners per tonne)

Year	India	Guatemala	Others	Total
1962	15.8	17.6	16.5	16.0
1963	13.8	14.6	10.2	14.0
1964	15.2	15.6	11.8	15.2
1965	22.0	20.4	20.0	20.9
1966	37.9	32.6	37.1	34.6
1967	31.0	30.4	21.6	29.5

PROSPECTS OF EXPORTS

During the period (1964-67) of lower production in India, India has per force chosen to export to the more



lucrative Middle East countries and has not bothered much about Scandinavian and European markets. When production as programmed for 1975-76 is achieved, it will be necessary to make an attempt to recapture a portion of the lost market in this region. For this purpose, it is necessary to lower prices to some extent and it is anticipated that a reduction of ten per cent might suffice since in 1966 Guatemala prices also rose substantially and have stayed high in 1967.

It is believed that the volume of exports of Indian cardamom can be significantly raised without breaking unit prices too heavily. The recommendation is to hold the unit value at around Rs.42,000 per tonne which is a fair price for an average estimated Rs.25229 per tonne cost of production. This figure is also indicated by major dealers as an optimum price for cardamom exports to Saudi Arabia. The importers at Jeddah suggest a price of Rs.34,000 to Rs.42,000 per tonne.

Table 24 gives projections for exports for the years 1970-71 and 1975-76; these figures are compared with related figures for the years 1960-61 and 1966-67.

Indian exports of cardamom which were 1536 tonnes in 1967-68 valued at Rs.71.6 million, are targetted to expand to 2300 tonnes valued at Rs. 96.6 million (at Rs. 42000/- per tonne) by 1970-71. There is every indication that the value realisation may be higher because of the disparity between available supplies and world demand.

To achieve an export of 2300 tonnes in 1970-71, a production of 3,000 tonnes of cardamom is essential. This by itself should not be too formidable a task as in the year 1966-67, 2700 tonnes were produced and the current crop is expected to be about the same. A higher volume of production has not been suggested because cardamom is a crop which fruits only in the fourth year of planting and as such any programmes put into operation during the coming year would not be in a position to give this yield before 1970-71.

By the developmental activities which are likely to take place in the cardamom plantations in the next few years, it is estimated that the production of cardamom will be raised to the tune of 3500 tonnes by 1975-76. The exports anticipated in that year will be of the order of 2650 tonnes.



## V - THE PATTERN OF USAGE OF CARDAMOM

### CARDAMOM-COFFEE (GAHWA)

The major usage of cardamom in the Middle East is in coffee. This cardamom-coffee is called as "Gahwa" and is a traditional drink with Arabs of the Gulf Area. The maximum consumption of this coffee is in Saudi Arabia where it is the drink of the rural and nomadic population (Bedouins) and of Arabs residing in towns. In Bahrain and Kuwait also the drink is fairly popular even though consumption of tea and other beverages has increased substantially.

The amount of cardamom used in the coffee varies from place to place and from people to people. The high cost of cardamom has come to play a significant role in the quantities used; only rich people are able to use higher percentages of cardamom. In the Western Gulf area (Dammam region of Saudi Arabia, Bahrain and Kuwait), the usage in total content ranges from about 5 per cent to about 25 per cent; in Central Saudi Arabia, it is between 25 per cent and 50 per cent, and in Eastern Saudi Arabia (Jeddah, Mecca), it is about 25 per cent. While these are broad indications of usage, it is to be noted that the financial position of the consumer has a lot to do with the percentage of use.

The future scope for cardamom usage in coffee is fairly stable even though there is a gradual shift to other beverages. Tea, Coco-cola, Pepsi-cola and juices

are becoming increasingly a part of the Arabs beverage habit, but, the shift is not likely to affect the consumption of cardamom for this purpose, at least for the next ten years.

In the Middle East, about 95 per cent to 98 per cent of cardamom imported is used in coffee.

#### USAGE IN CONFECTIONERY

In the European and American continents and particularly in Scandinavian countries (Sweden, Finland), cardamom finds use in confectionery preparations. Powdered cardamom is used in cakes and pastries, which method of usage is likely to show an increasing trend.

#### OTHER USES

In the Middle East and elsewhere over the world cardamom is used as a flavouring agent in sweets and other such preparations and in curries.

Powdered cardamom mixed with ginger, cloves and caraway is used as a medicine for digestive troubles.

Cardamom oil extracted from the seeds is used in perfumes and for flavouring liquors. There is a substantial usage of cardamom for this purpose. Bush Berke Roberts (E.I.D. Parry's Associates) at Madras extract cardamom oil.

#### MODERN TECHNOLOGY AFFECTING USAGE

Though no oleo-resin is extracted from cardamom, modern technology has made it possible to obtain a



"super-resin" (Trade mark by Fritzche Brothers Inc., U.S.A.) which is a combination of essential oil and oleo-resin.

A combination of essential oleo-resin mixtures specially prepared from cardamom known as "Bakeresin" (Trade mark pending) is now in use in bakeries.

For extraction of "super-resin" and "Bakeresin", cardamom of different varieties, green, bleached and decorticated are used depending upon the type required.

Super-resin cardamom is a dark green liquid with minimum 50 per cent volatile oil. Four lbs of this super-resin is equivalent in flavour strength to 100 lbs of natural cardamom.

Consequent on this usage, cardamom as such has been replaced in a few cases by the use of "super-resin" and "bakeresin". The essential oil and flavour industry has thus in recent times invaded this spice also.





## APPENDIX: I

RESEARCH OF CARDAMOM: AN EVALUATIONA: RESEARCH WORK ON CARDAMOM CONDUCTED BY THE  
INDIAN COUNCIL OF AGRICULTURAL RESEARCH

This Council works under the Ministry of Food and Agriculture and has taken over the cardamom research stations in Mysore, Madras and Kerala. The Council carries out its research at stations situated at (1) Pampadampara - Kottayam district, established in 1956, (2) Mudigere - Chickamagalur district, established in 1957, and (3) Chettali - Coorg district - established in 1960. The Chettali research station carries out research schemes for other spices also while the former two conduct research only on cardamom.

PROGRAMME OF WORK DONE AT PAMPADAMPARA

This research station has research programmes on agronomic work only and has done very little on diseases and pests.

The annual grant for this research station is Rs.47,000/- and roughly about Rs.5.6 lakhs have been spent on this station in the last 12 years.

The preliminary research findings of this center are related to agronomic problems only. They have found that "scarification" (scratching of seeds) reduces the time taken for germination but does not have any effect on the percentage of germination. Another finding is that "Fytolan" sprayed fortnightly saves plants from damping

off, and similarly spraying of "Cerosan" prevents a similar condition in seedlings.

Some Research on liming conducted at this station suggests that 1000 Kgs. of lime per hectare is necessary in Kerala and Mysore because of leaching due to rainfall.

This station has selected certain types of cardamom based on yield and disease resistance for further agronomic research.

Some work on irradiation has also been conducted at this station and their preliminary conclusions are that seeds irradiated with 30 KR radiation give a better yield per hectare than other concentrations.

Research work done at this station includes small trials on manuring, spacing etc.

The station also has a programme for trials to control soil erosion and to study "trace" elements. These are, however, still to be started.

#### RESEARCH WORK DONE AT THE MUDIGERE RESEARCH STATION

This research station has spent upto 1967 Rs.6.52 lakhs and its annual budget is Rs.40,000/-. The working of this station is now under the supervision of the University of Agricultural Sciences, Bangalore.

The preliminary research findings at this station includes the following:

- (a) That the plantation yield goes down from the 12th year of planting upto the 15th year and that replacing is essential by



the 20th year. \*

- (b) That mostly panicles come up in December whereas shoots come up during May, June and July. Therefore, the station has recommended that there should be two dosages of manuring; one of these should be post-monsoon manuring to encourage panicles and the other pre-monsoon manuring to encourage shoots.

This research station has also conducted some work on insects and other pests and its work on the red hairy caterpillar has indicated that spraying of DDT and BHC (50 per cent) helps eradicate this pest while control of thrips is possible by spraying with Ekatox - 15.

Manuring Trials are also to be taken up at this station but they are still to be started.

The station is also working on some species of cardamom obtained from Abyssinnia which were originally brought by the "Balehannur" research station. The latter has now been converted into Coffee Research Station and all work on cardamom has been suspended there.

#### RESEARCH WORK CONDUCTED AT CHETTALI

This station has spent upto 1967 Rs. 3.7 lakhs and its annual budget is Rs.55,000/-. The higher annual budget is due to the fact that the station conducts research on all spices.

Spacing Trials were initiated here in 1961 on cardamom and based on preliminary findings, the station



has suggested that 4 ft. x 4 ft spacing is good for yield. This good yield may not continue over the years and therefore the findings are still to be watched before any conclusions can be drawn. The current practice is to space plants 3 metre x 3 metre.

Since 1962 manuring trials have also been carried out at this station for which plants were spaced 8' x 8' (roughly 3 metre x 3 metre). These trials are still in the stage of pre-treatment yield and actual research work on manuring has not yet commenced.

The station was also to undertake research on diseases but no work could be done as there was not sufficient staff for this purpose.

#### INCIDENCE OF MOSAIC (KATTE) DISEASE

Data available on incidence of Mosaic (Katte) disease indicate that there is 80 per cent incidence of this disease in Kanara districts; in well managed plantations the disease incidence is only 15 per cent while in seedling plantations, it is only 0.3 per cent in the first six years. The disease usually attacks the plant in the 6th or 7th year. Therefore, it is essential that proper spraying and other pest treatments be done in plantations and on plants that reach an age of six years. It may be necessary to evaluate the number of plants of this age and to offer subsidies to growers to take preventive measures.



Research conducted by other agencies including the Indian Agricultural Research Institute on the "Virus" causing the "Katte" disease indicate that this particular Virus is carried by the "Banana Aphid" which lives on the cardamom and Banana plants in winter months. Originally 0.1 per cent Nicotine Sulphate was used for spraying to control this aphid but now the opinion is that 0.5 per cent "Folidol" is better.

#### THE CURRENT PLAN TO ERADICATE MOSAIC (KATTE) DISEASE

On the basis of research done, three measures to control this disease are under implementation. They are:

1. Sanitation - including removal of infected plants and their burning or destruction at the spot.
2. Regular checking of infection - by usage of pesticides for aphids.
3. Usage of seedlings - for new planting instead of Rhizomes. Planters generally prefer to use Rhizomes because the yield from Rhizome plants come one year earlier and there is no need for a nursery.

To counter the effect of Mosaic (Katte) disease some State Governments and the Cardamom Board have programmes for giving healthy plants to the growers.

The Mysore Government has a scheme at Saklespur (since 1966) to supply virus-free seedlings to growers

without any cost. The Government has earmarked Rs.1.2 lakhs for this purpose.

The Madras Government has also a scheme to supply virus. free plants to producers, (details still to be obtained).

As a proposal for the Fourth Plan, the Cardamom Board in 1965 presented a programme covering six items involving a total expenditure of Rs.1.15 crores. This programme included the following aspects of cardamom cultivation.

1. Eradication of Mosaic (Katte) disease - Rs.80/- lakhs allocated. This programme includes spotting of the disease area and subsidy to producers at the rate of Rs.150/- for 200 diseased plants removed.
2. A loan scheme offering Rs.1200/- per acre for extension of cardamom area - Rs.25 lakhs allocated.
3. An allocation of Rs.10 lakhs for hire-purchase of other requirements of cardamom growers.
4. Supply of manures and pesticides and insecticides for plant protection - Rs.5 lakhs allocated.
5. Research - Rs. 10 lakhs allocated.
6. Publicity and marketing - Rs.15 lakhs allocated.



ICAR PROPOSAL FOR FUTURE RESEARCH DURING THE IVTH  
PLAN 1969-1974

The Indian Council of Agricultural Research has prepared a proposal designated as the "All-India Coordinated Research Project on Spices" to cover research programmes during the IVth Plan period. This overall plan will spend Rs.14 lakhs in five years at the three research stations maintained by the ICAR.

The proposal envisages the setting up of a main centre for technological and disease work at Kottayam. The plan is expected to extend to two or three more Plan periods to give continuity to the work undertaken during the IVth Plan period.

The priorities for work during the IVth Plan period as per this proposal is as follows:

1. Investigation, both fundamental and applied, on Mosaic (Katte) disease.
2. Entomological work on Thrips and on the Hairy Caterpillar.
3. Agronomical investigations including spacing, liming, and manuring etc.
4. Research on Breeding with particular reference to obtain plants resistant to diseases.
5. Research related to "Processing" including retention of green colour of cardamom, technologies on oil extraction and bleaching and others.

CONCLUSION

The three research stations have incurred an expenditure of about Rs.16 lakhs to date on cardamom research and have done work mainly on agronomical aspects leaving the disease and pest problems practically untouched. The annual budget of these three stations is about Rs.1.42 lakhs. This is grossly inadequate. Indeed, this inadequate treatment of diseases constitutes a major tragedy in the spices field.

The proposal for the IVth Plan period envisages an annual expenditure of Rs.2.8 lakhs at these research stations with top priority given to research on diseases and pests. It is essential that this programme be allowed to go through now even though the effect of the research can make itself felt only after about five years.



B: RESEARCH WORK DONE AT THE CENTRAL FOOD  
TECHNOLOGICAL RESEARCH INSTITUTE, MYSORE

The Central Food Technological Research Institute has undertaken research programmes on cardamom with particular reference to its green colour and extraction of cardamom oil.

RESEARCH ON PRESERVATION OF GREEN COLOUR

The export market for cardamom is increasingly becoming conscious of the green colour of cardamom. Because of this, cardamom of the same size fetches an extra price varying from Rs.8/- to Rs.10/- per Kg. depending on the intensity of its green colour. The principal reason for this preference for dark green colour in the importing countries is the belief that cardamom which is dark green in colour represents freshly processed cardamom which has not been stored for long. This is true to a large extent as when cardamom is stored for long periods the initial green colour fades rapidly.

Systematic experiments have been carried out at the Central Food Technological Research Institute, Mysore, (Dr. H.A.B. Parpia, Director) with a view to upgrading the quality of dried cardamom from this particular standpoint. The persons who have associated themselves with this work at the above Institute are Mr. C.P. Natarajan, Chairman, Discipline of Spices and Flavour Technology, S. Kuppuswamy, M.N. Krishnamurthy, Thomas D'Souza and K.K. Gopalan.

The results of the experiment on preservation of green colour in cardamom are briefly described in the quotation below:

RAW MATERIAL:

"It was obvious, early in the course of our investigations that it is not possible to regenerate green colour from the skins of over-mature cardamom fruits once their colour had already begun to turn yellow. It is therefore imperative that to obtain dried cardamom with green colour, we should start with cardamom fruits whose skin are also bright green without any appreciable yellowish tinge. Since, from the point of view of optimum yields, only mature cardamom fruits should be harvested for drying, it follows that the colour of their skin should be still green when fully mature (as indicated by the black colour of the seeds within). Our investigations on the quality of cardamom fruits grown in different areas of Kerala, Mysore and Madras States have shown that the relationship of their skin colour to maturity depends on variety as well as agro-climatic factors. It has been our observation that the colour of the vast bulk of the cardamom fruits are still green at the time of harvest in most areas of Kerala State. This is the reason why the colour of the dried cardamom produced in Kerala is on an average greener than dried cardamom produced elsewhere.



The genesis of the term "Alleppey Green" can also be traced to the above fact, because most of the dried cardamom produced in this area used to be exported from Alleppey port in olden days. On the other hand, the colour of the skin of a majority of cardamom fruits begins to turn yellow before they are mature and ready for harvest in certain areas of Mysore State like Saklespur and Mudigere, so much so that sun drying of cardamom fruits is practised on a fairly wide scale in these areas - a practice almost unknown in Kerala and Madras States.

#### Pre-treatment

The constituent in cardamom skin responsible for its green colour, as in most green leaves and vegetables, is the common plant pigment, chlorophyll. It was thought worthwhile to find out whether by a suitable alkali treatment the green colour of cardamom could be stabilized during processing and storage.

Among the different alkaline salts available for this purpose, sodium carbonate (washing soda) was found most suitable on account of (i) easy availability; (ii) comparative cheapness and (iii) ease of handling (because of its non-caustic nature). After a number of trials the optimal conditions of alkali treatment were found to be soaking the freshly harvested green cardamom fruits in 2 per cent washing soda solution for 10 minutes, since further increase in the washing soda concentration or the soaking time did not confer any additional benefit.

Directions for the Alkali Treatment

For every 100 Kgs. of fresh cardamom prepare 20 gallons of 2 per cent washing soda solution by dissolving 2 Kgs. (4 lbs.) of washing soda in 100 litres (20 gallons) of water. Place the cardamom fruits in a piece of cloth or in a wire basket and dip in the washing soda solution for 10 minutes. Drain and spread out in the cardamom stove to dry.

Table I is a ready reckoner giving the volume of the washing soda solution necessary for dipping different quantities of cardamom fruits and the corresponding weight of washing soda required for making the solution. The washing soda should be added to the water in small quantities at a time to avoid lumping. The washing soda solution must preferably occupy not more than  $\frac{3}{4}$ ths or less than  $\frac{1}{4}$ ths the volume of the container.

TABLE I

Quantity of cardamom fruits (Kgs.)	Volume of washing soda solution required: litres	Wt. of washing soda to be dissolved: Kgs
10	10	0.2
20	20	0.4
40	40	0.8
60	60	1.2
80	80	1.6
100	100	2.0



It is advisable to clean the harvested fruits first in water before the alkali dip. This helps to remove the adhering dirt thereby making it possible for the alkali solution to be used over and over again. The alkalinity of the washing soda solution does not appreciably change with serial dipping of fresh lots of cardamom fruits with the result that such serial dipping does not diminish its efficacy in stabilizing the green colour of cardamom skin. Actual trials in a number of Estates have shown that the cardamom fruits can be dipped at least 10 times in the same washing soda solution without any adverse effect on the appearance and storage properties of the dried cardamom. This means that 2 Kgs. of washing soda is sufficient to treat one tonne of freshly harvested cardamom fruits. It is however essential that the cardamom fruits are drained of water thoroughly before the alkali dip to avoid diluting the washing soda solution.

It would be worthwhile for medium and large Estates to have near about the cardamom stoves, a pair of cement tanks of appropriate size (depending on the quantum of daily picking of cardamom fruits during the peak season)- one to hold water for the preliminary cleaning of the fruits and the other to hold the washing soda solution. Needless to say the washing soda tank must be protected from rain to avoid dilution.



Drying:

Since the green colour of the cardamom skin is extremely photo-senstive and rapidly fades in sun-light, the alkali treated cardamom fruits have to be dried only in the stoves and not in the sun.

Experiments carried out on a number of cardamom Estates in different areas have shown that the alkali dip increases the rate of drying of the cardamom fruits to an appreciable extent particularly in the early stages. This is not surprising and is analogous to the well known effect of similar dips in hastening the drying of fruits like grapes in the sun--a phenomenon attributed to the removal (as a result of the dip) of the waxy bloom on the skin making it more pervious to the transport of moisture from within.

The rate of drying of cardamom in the stoves would depend not only on the dry bulb temperature but also on the wet bulb depression (i.e. difference between the dry bulb and wet bulb\* temperatures). For obtaining cardamom of superior quality, the dry bulb temperature in the stove should not be allowed to exceed 125 - 130°F. It is, therefore, imperative from the point of view of quick drying of cardamom that the wet bulb temperature (which is an index of the moistness of the air or inversely its capacity to pick up moisture from the cardamom) is kept as low as possible. The obvious way to achieve this optimal condition



of drying is to arrange for the periodical flushing out of the moist air within the cardamom stove and its replacement, with fresh dry air from outside. Where power is available, this is best done by providing an appropriate number of exhaust fans at the side walls of the stove just below the ceiling together with some inlets for fresh air above the ground level. In the absence of power (which is the case on most cardamom estates at present), the only feasible alternative to exhaust fans would be ventilators, which, on being kept open for short periods at regular intervals during the course of drying, give to a certain extent the same effect through natural convection of the air.

#### Storage:

For efficient retention of the green colour of the skin of cardamom during storage, it is essential that the cardamom should be dried down to a moisture content of 10 per cent. Cardamom dried down to this level does not reabsorb moisture if stored in 300 gauge polythene-lined gunny bags.

Storage studies with cardamom samples from various estates in different areas dried after alkali treatment have shown that the green colour of their skin is quite stable upto 10 months in contrast to the colour of the control samples (dried without the alkali treatment) which fades to an appreciable extent during the same period.

Costing:

Alkali treatment of cardamom fruits prior to drying need not involve any additional labour cost as it can be carried out by the person in charge of the stove with the help of the harvesting labour.

As already mentioned, 2 Kgs. of washing soda (costing Rs.2/-) is required to treat one tonne of fresh cardamom fruits. On the basis that the yield of the dried product from one tonne of cardamom fruits is 200 Kgs., the cost of alkali treatment works out to 4 to 5 paise per kg. of dried cardamom inclusive of labour and other costs."



C: RESEARCH CONDUCTED BY THE INDIAN  
AGRICULTURE RESEARCH INSTITUTE

The Indian Agricultural Research Institute in its Mycology and Plant Pathology Division has two virus sub-stations - one at Poona and the other at Simla. Research work is also being conducted at Delhi and at Darjeeling.

Dr. S.P. Raychaudhuri, Head of the Division of Plant Pathology and Mycology, and S.N. Chatterjee have carried out some researches on "Chirke" disease of large cardamom *AMOMUM SUBULATUM* Roxb. Their research on this disease is complete and recommendations have been made to counter this particular disease which has attacked "large" cardamom in the Darjeeling and Sikkim areas. Extension work is required now to make possible the control of this disease.

In this disease the leaves of the plant are first of all affected and exhibit mosaic streaks. Thereafter the leaves coalesce and eventually turn brownish and dry up. The number of flowers in the diseased plants is extremely reduced and only one to five flowers develop in one panicle as against 16 to 20 flowers borne by healthy plants. The Virus which causes this disease is sap-transmissible and also spreads by the agency of the "corn" aphid called as *Rhopalosiphum maidis*. The disease could be transmitted by aphids to both large cardamom and wheat in a short acquisition feeding period of 5 minutes.



The following table makes an assessment of comparative loss due to chirke disease of large cardamom during 1962-64.

ASSESSMENT OF LOSSES DUE TO CHIRKE DISEASE OF LARGE CARDAMOM DURING 1962-1964

Year	Healthy (out of 100 clumps)				Diseased (out of 100 clumps)			
	Total No. of		Total weight		Total No. of		Total weight	
			of (in gms.)				of (in gms.)	
	Fruits	Seeds	Fruits	Seeds	Fruits	Seeds	Fruits	Seeds
1962	193	1200	82.0	-	192	1162	78.0	-
1963	1156	16113	2715.7	449.5	546	4973	867.2	193.3
1964	1602	24909	3438.6	651.9	237	2958	115.5	64.8

Year	Loss in percentage			
	No. of		Wt. of	
	fruits	seeds	fruits	seeds
1962	0.51	3.16	4.87	-
1963	52.76	69.13	68.06	56.99
1964	85.20	80.09	96.64	88.12

Of the three varieties of large cardamom namely "Ramnok", "Ramsai" and "Sawney" which are grown in Sikkim and Darjeeling the variety "Sawney" has been found to have a very high degree of tolerance to infection with the virus; the other two varieties as also *Amomum aromaticum*, are susceptible. Further research has found that the variety "Kopringer" is also resistant to this virus.

Easy control measures have been suggested to eradicate this disease. As an immediate measure stocks of disease free Rhizomes of large cardamom should be built up and propagated for distribution to the cultivators. Healthy nurseries of cardamom seedlings should be maintained for a large scale distribution to cultivators.



Distribution of diseased free Thizomes should be made to the growers only after proper seed certifications on scientific basis.

The Poona centre of the I.A.R.I. has conducted research on the "Mosaic" (Katte) disease. Rooting out infected plants and their destruction is said to be a good method for eradicating this disease.

APPENDIX IICARDAMOM CULTIVATION

Cardamom cultivation scientifically undertaken and constantly "protected" represents, in our opinion, one of the most profitable enterprises currently available in the Indian Union. Much of this profitability arises from the steep rise in prices in the last three years due predominantly to shortages of supply. Unit values of different types of cardamom, and cardamom seeds are as shown in the table below. Selling prices have risen in the last three years by over 200%: costs may have risen by 50% largely because virtually the same overheads cover a much reduced output in the case of most estates. The reason for the reduced output is due predominantly to katte disease which has seriously affected the crop in several estates surveyed, but adverse climatic conditions in 1966-67 and 1967-68 have also contributed significantly.

UNIT VALUES OF INDIA'S EXPORTS OF CARDAMOM, BY TYPES  
1964-65 to 1966-67

S. No.:	Type of cardamom:	Unit Value -			:Difference between	
		: Rs. per tonne			:1964-65 and 1966-67	
		:1964-65	:1965-66	:1966-67	:Actual	: % increase
1.	Cardamom small Alleppey Green	19265	39133	50204	+30939	+160.6
2.	Cardamom small Coorg Green	15883	35111	44267	+28384	+178.7
3.	Cardamom large	4591	6475	18015	+ 8424	+183.5
4.	Cardamom small - bleached or bleachable	18406	37717	48374	+29968	+162.8
5.	Cardamom small seeds	17726	37981	65241	+47515	+268.0
6.	Cardamom small others	11727	10846	41695	+29968	+255.5
	TOTAL(Average)	16143	31566	47266	+31123	+192.8



Profitability margins turn significantly on the yield rate per acre both on old and new cultivations. Of 59 units surveyed by the Marketing Research Corporation of India, nearly 22 were unable to give any reliable figures from books maintained or checked. In the case of 37 where figures were maintained the conditions varied enormously. Some units were supremely efficient, reaching yields in good years of between 100 to 138 kgs. per acre. The table attached presents average costs in two sections, those above 50 acres and those of 50 acres and below. It suggests that the size of the plantation is not of itself a maker of efficiency, though obviously some minimum is necessary. In the 37 plantations as a whole average costs work up to Rs.320 per acre, a figure which can be applied to a new garden after the third year. But the average yield of 12.70 Kgs. is obviously too low for a new investment. Yet this low figure which would make average costs Rs.25.22 per kg. would still in current conditions be quite profitable.

#### Yield Rates and Profitability:

With a view to estimating the pattern of yield rate over the last 7 years ending with 1967-68, seventeen cardamom plantations with the area of 50 or more acres were selected for a more detailed study. The highest yield rate of 138 Kgs. per acre was achieved by a firm with an area of 110 acres during 1963-64, while the lowest yield



of 0.85 kgs. per acre was registered by another unit with an area of 108 acres in 1966-67. Such a vast difference in yield rate is attributed to the types of lands, location, fertility, irrigation facilities, diseases, and the suitability of the land to cardamom cultivation. This will continue to be the pattern of production for some time. As can be seen from the table attached the annual average yield rate of these firms works out to 41.2 kilogrammes in 1961-62 which has declined gradually and reached the low level of 14.2 kgs. per acre in 1966-67 and 18.5 kgs. per acre in 1967-68. The main reason for the low yield rate during the last two years was stated to be the drought conditions and untimely rains. Besides this, 'katte' disease also caused considerable damage to the plantations. The decline in yield rate can also be ascribed to the sudden (statistical) increase of about 33 per cent in the area under this plantation crop. (Areas under cardamom is given as 55000 hectares in 1964 to 72800 hectares in 1965 and 73100 hectares in 1966). The low yield rate of 12.70 kgs. per acre in 1967-68 when all the plantations are put together may not be far from actuals for the units contained in the survey.

For new cultivation, however, when lands are carefully selected and protective measures taken against diseased plants, a yield of 75 kgs. per acre : from the



fourth or fifth year is quite feasible. If cardamom land of this suitable kind costs Rs.2000 per acre and cultivation costs for three years are reckoned high at Rs.1000 per acre per year, investment per acre may be reckoned at Rs.5000 per acre, over the first three years. Against this, return from the fourth to the fourteenth\* year on an average crop of 75 kgs. per acre will be currently Rs.3000 per acre at Rs.40 per kg. "White" cardamom seeds, due to premature picking, must be carefully avoided. The return will be at least 60 per cent on capital invested: it could be double if the best yields were attainable and current prices, which are now higher than Rs.40 per kg., obtained.

On old cultivations where land was purchased at a much lower rate, new investment on replanting areas invaded by katte would be much more profitable. On such estates average yields are between 3 and 12 kgs. only. Replanting could, on suitable cardamom soil, give 75 kgs. per acre. Investment would only be of the order of perhaps Rs.4500 per acre for three years or Rs.1500 per year. If the increased yield is 50 kgs., the return at Rs.40 per kg. would be Rs.2000 per year, maintenance expenses being as before or 133 per cent of new investment. The total return would, of course, be higher.

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\*It is advisable to replant entirely between the twelfth and fifteenth year as katte seems to develop much more rapidly on aged plants.

Required: A Feasibility Study

The whole problem of what profitability could be in cardamom has been initiated by the arbitrary and hasty manner in which land has been allocated for cardamom cultivation. One estimate is that four fifths of such land is unsuitable. Protective measures against katte have not been adequate even on many large estates. Thus future investment which is almost spectacularly attractive has not been seen in its appropriate perspective under the best possible conditions.

It is recommended that a detailed feasibility study, based on availability of the most suitable land and on the application of knowledge of protection against plant diseases, should be undertaken without delay.



YIELD RATE OF CARDAMOM

(17 Selected Large Scale Plantation)

Sample	:Base of: :the : Production (in Kgs.) :planta-:1961-:1962-:1963-:1964- : 1965-:1966-:1967-:age :tion : 62 :63 :64 :65 : 66 :67 :68 :yield :(Acres): : : : : : : : :per : : : : : : : : :acre								Annual :Aver-
1	56	1775	1600	2600	800	1000	900	..	25.82
2	108	873	342	289	189	143	92	..	3.00
3	50	..	..	2189	3316	883	929	849	32.70
4	50	150	250	250	150	155	166	..	3.70
5	50	..	..	476	1837	668	1066	628	18.70
6	60	..	1250	1400	1600	175	125	150	13.10
7	50	..	2000	1800	3000	2000	1000	650	34.80
8	150	962	3086	1672	1058	420	406	2000	9.10
9	60	..	1134	1179	1087	1225	1858	900	20.50
10	110	..	11667	15225	10191	4704	1552	5116	73.40
11	153	..	..	7000	6000	4500	4000	3000	32.00
12	100	..	..	..	..	..	2850	2800	23.30
13	75	..	..	..	..	2000	1600	1500	22.70
14	150	..	..	..	..	3200	3200	3000	20.70
15	50	..	..	..	1200	1200	1000	900	21.50
16	308	23929	8315	1956	320	5382	1615	..	22.50
17	150	..	..	..	..	3000	..	1800	16.00
Total produc- tion 1730		27689	29644	36036	30948	27455	22359	22293	
Area covered		672	952	1205	1255	1480	1580	1208	
Yield rate (in Kgs. per acre)			41.2	31.1	29.9	24.50	18.55	14.2	23.50



# THE COSTS OF PRODUCTION OF CARDAMOM

(M.R.C.I. SURVEY, MARCH-APRIL 1968)

	: Expenditure per acre per year (Rs.)**		
	: Total of : 37 farms :	: 25 farms : each with : less than : 50 acres	: 12 farms : each with : more than : 50 acres
<u>COST OF (Rs.)</u>			
1. Harvesting	1816.49(25)	1297.56(18)	518.93(7)
2. Weeding	1129.58(31)	847.82(22)	281.76(9)
3. Curing	1602.93(33)	1278.97(24)	323.96(9)
4. Plant Protection	1711.58(26)	1003.61(19)	707.97(7)
5. Other charges	472.04(19)	279.02(14)	193.02(15)
TOTAL COST OF CULTIVATION	7816.94*	5056.98*	2759.96*
6. Land Tax (Rs.)	125.26	71.45	53.81
7. Share of establishment charge (50% over cost of cultivation) (Rs.)	3908.47	2528.49	1379.98
TOTAL COST OF PRODUCTION (RS).	11850.67	7656.92	4193.75
<u>AVERAGE EXPENDITURE PER ACRE (Rs.)</u>			
1. Harvesting	72.66	72.02	74.31
2. Weeding	36.44	38.54	31.31
3. Curing	48.55	53.30	36.00
4. Plant Protection	65.83	52.82	101.14
5. Other charges	24.84	19.93	38.60
AVERAGE COST OF CULTIVATION ∴ (per acre)	211.25	202.28	230.00
6. Land Tax	3.55	2.98	4.89
7. Share of establishment charges	105.62	118.30	115.00
AVERAGE COST OF PRODUCTION (per acre)	320.29	306.28	349.48
TOTAL ACREAGE (Acres)	1634	600	1034
TOTAL PRODUCTION (Kgs.)	20761.7	9361.7	11400.0
Average annual production of cardamom (per acre) (Kgs.)	12.70	15.60	11.02
AVERAGE COST OF PRODUCTION PER KILOGRAMME (Rs.)	25.22	19.63	31.71

\* The total cost of cultivation shows a higher figure than the straight total of items 1 to 5 as in some cases the cost of cultivation is given as an overall figure and not with breakdown for each head of expenditure.

\*\*Total of specified number of farms.

NOTE: Figures in brackets represent the number of farms for which information for the corresponding item was available. These figures have not been used for working out the average expenditure per acre.



STATISTICAL TABLES

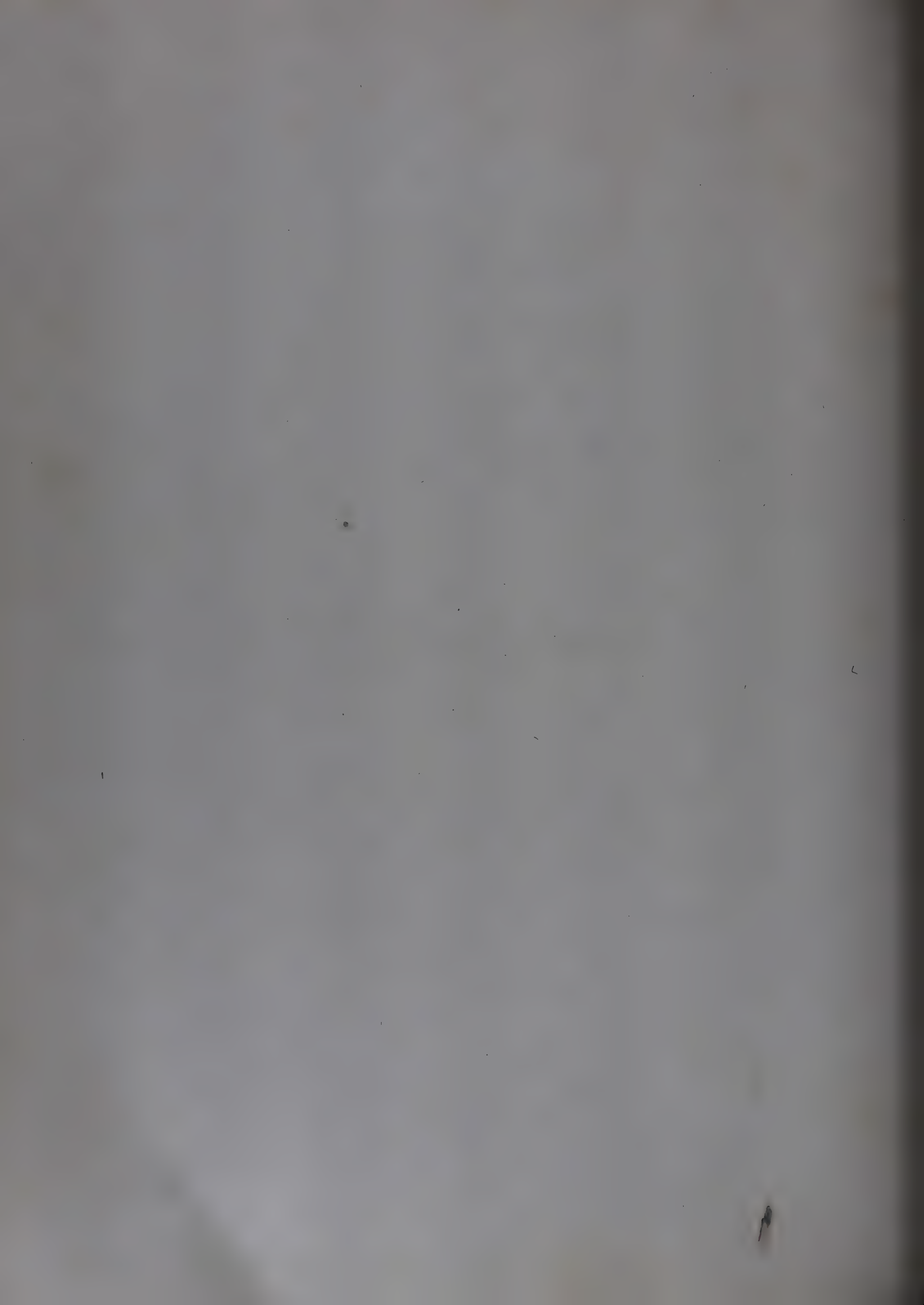




TABLE NO. 1

CARDAMOM - AREA UNDER CULTIVATION AND PRODUCTION -  
WORLD - 1960 - 1966

Year	Area (in '000 Hectares)				Total*
	India	Ceylon	Guatemala & Thailand		
1960	55.8	4.7	N.A.		60.5
1961	54.6	4.1	N.A.		58.7
1962	54.6	4.9	N.A.		59.5
1963	54.6	4.1	N.A.		58.7
1964	55.0	3.6	N.A.		58.6
1965	72.8	4.1	N.A.		76.9
1966	73.1	5.4	N.A.		78.5

Year	Production (in '000 tonnes)					Total
	India	Ceylon	Guatemala **	Thailand**		
1960	3.3	1.7	0.4	N		5.4
1961	3.2	1.2	0.2	0.1		4.7
1962	3.4	1.5	0.4	0.1		5.4
1963	4.1	1.5	0.4	0.1		6.1
1964	2.2	1.3	0.4	0.2		4.1
1965	2.0	1.6	0.4	0.1		4.1
1966	2.7	1.5	0.4	0.2		4.8

Source: 1. Conclusions and Recommendations of the Seminar on Cardamom, IIFT, 1967.

2. Tropical Products Quarterly, March 1968 published by the Commonwealth Secretariat, Commodities Division.

3. F.A.O., Rome.

Note: \*Total of India and Ceylon only.

\*\*Represents export figures; domestic consumption is negligible. Hence these figures can be considered as equivalent to "production".

N.A. - Not available.

N - Negligible

The data for India relate to crop year beginning.

TABLE NO.2.

## STATEWISE AREA UNDER CARDAMOM CULTIVATION IN INDIA

Year	(in '000 hectares)				Total
	Kerala	Mysore	Madras	Uttar Pradesh	
1944-45*	23.3	17.1	6.4	-	46.8
1956-57*	28.8	17.6	5.8	-	52.2
1958-59@	29.9	18.6	5.7	-	54.2
1959-60@	28.7	20.2	6.1	-	55.0
1960-61@	28.7	21.0	6.1	-	55.8
1961-62@	28.7	20.6	6.1	Neg	55.4
1962-63@	28.7	20.6	5.7	Neg	55.0
1963-64	N.A.	N.A.	N.A.	Neg	60.7
1964-65	N.A.	N.A.	N.A.	Neg	72.8
1965-66@	46.9	19.4	6.5	Neg	72.8
1966-67	N.A.	N.A.	N.A.	N.A.	73.1
Percentage difference in area between 1960-61 and 1965-66	+63.4%	-7.6%	+6.6%	-	+30.5%

Source:

\*Report on the Marketing of cardamom in India, Directorate of Marketing and Inspection, Govt. of India, 1963.

@Conclusions & Recommendations of the Seminar on Cardamom, I.I.F.T., 1967.

Note: N.A.: - Not available.



TABLE NO. 3

ESTIMATES OF COST OF PRODUCTION OF CARDAMOM  
( M.R.C.I. SURVEY, MARCH - APRIL 1968 )

	<u>Expenditure per acre per year (Rs) **</u>		
	<u>Total of 37 farms</u>	<u>25 farms each with less than 50 acres</u>	<u>12 farms each with less than 50 acres</u>
<u>COST OF (Rs.)</u>			
1. Harvesting	1816.49	1297.56	518.93
2. Weeding	1129.58	847.82	281.76
3. Curing	1602.93	1278.97	323.96
4. Plant Protection	1711.58	1003.61	707.97
5. Other Charges	472.04	279.02	193.02
TOTAL COST OF CULTIVATION	7816.94*	5056.98*	2759.96*
6. Land Tax (Rs.)	125.26	71.45	53.81
7. Share of establishment charge (50% over cost of cultivation) (Rs.)	3908.47	2528.49	1379.98
TOTAL COST OF PRODUCTION (Rs)	11850.67	7656.92	4193.75
<u>AVERAGE EXPENDITURE PER ACRE (Rs)</u>			
1. Harvesting	72.66	72.02	74.31
2. Weeding	36.44	38.54	31.31
3. Curing	48.55	53.30	36.00
4. Plant Protection	65.83	52.82	101.14
5. Other charges	24.84	19.93	38.60
AVERAGE COST OF CULTIVATION PRODUCTION (per acre)	211.25	202.28	230.00
6. Land Tax	3.55	2.98	4.89
7. Share of establishment charges	105.62	118.30	115.00
AVERAGE COST OF PRODUCTION (Per acre)	320.29	306.28	349.48
TOTAL ACREAGE (Acres)	1634	600	1034
TOTAL PRODUCTION (Kgs.)	20761.7	9361.7	11400.0
AVERAGE ANNUAL PRODUCTION OF CARDAMOM (Per acre) (Kgs.)	12.70	15.60	11.02
AVERAGE COST OF PRODUCTION PER KILOGRAMME (Rs.)	25.22	19.63	31.71

\*The total cost of cultivation shows a higher figure than the straight total of items 1 to 5 as in some cases the cost of cultivation is given as an overall figure and not with breakdown for each head of expenditure.

\*\*Total of specified number of farms.

TABLE NO. 4

PRODUCTION OF CARDAMOM IN CEYLON, GUATEMALA  
AND THAILAND, 1951 - 1966

Year	Ceylon	Guatemala*	Thailand*	Total
1951	0.5	0.02	0.4	0.9
1952	0.9	0.04	0.2	1.1
1953	0.7	0.02	0.2	0.9
1954	0.6	0.07	0.2	0.9
1955	2.2	0.07	0.1	2.4
1956	2.3	0.03	0.4	2.7
1957	2.2	0.09	0.3	2.6
1958	2.5	0.07	0.1	2.7
1959	1.6	0.15	0.1	1.8
1960	1.7	0.4	N	2.1
1961	1.2	0.2	0.1	1.5
1962	1.5	0.4	0.1	2.0
1963	1.5	0.4	0.1	2.0
1964	1.3	0.4	0.2	1.9
1965	1.6	0.4	0.1	2.1
1966	1.5	0.4	0.2	2.1

\*Represents export figures; domestic consumption is negligible. Hence these figures can be considered as equivalent to "production".

N - Negligible

Source: F.A.O. Rome.



TABLE NO. 5

B92

## WORLD EXPORTS OF CARDAMOM - QUANTITY, VALUE AND UNIT VALUE

	1960	1961	1962	1963	1964	1965	1966	1967
<b>BY QUANTITY (in '000 metric tonnes)</b>								
India	1.92 (74.7)	2.25 (81.5)	2.39 (77.2)	2.12 (77.7)	2.14 (74.0)	1.35 (65.5)	1.47 (67.1)	1.56 (68.4)
Ceylon	0.16 (6.2)	0.16 (5.8)	0.15 (4.8)	0.15 (5.5)	0.14 (4.8)	0.14 (6.8)	0.13 (5.9)	0.12 (5.3)
Guatemala	0.45 (17.5)	0.23 (8.3)	0.41 (13.2)	0.37 (13.5)	0.39 (13.6)	0.43 (20.9)	0.44 (20.1)	0.45 (19.7)
Thailand	0.04 (1.6)	0.12 (4.4)	0.15 (4.8)	0.09 (3.3)	0.22 (7.6)	0.14 (6.8)	0.15* (6.9)	0.15* (6.6)
TOTAL	2.57 (100.0)	2.76 (100.0)	3.10 (100.0)	2.73 (100.0)	2.89 (100.0)	2.06 (100.0)	2.19* (100.0)	2.28* (100.0)
<b>BY VALUE (in Rs. Million)</b>								
India	37.4 (84.0)	34.2 (83.6)	29.9 (85.4)	28.4 (81.1)	30.6 (79.3)	35.3 (75.0)	67.1 (74.8)	73.9
Ceylon	3.6 (8.1)	3.2 (7.8)	2.4 (6.9)	2.3 (6.6)	2.3 (6.0)	4.1 (8.7)	6.7 (7.5)	N.A.
Guatemala	3.2 (7.2)	2.7 (6.6)	2.3 (6.6)	4.1 (11.7)	5.0 (12.9)	7.3 (15.5)	15.2 (16.9)	N.A.
Thailand	0.3 (0.7)	0.8 (2.0)	0.4 (1.1)	0.2 (0.6)	0.7 (1.8)	0.4 (0.8)	0.7* (0.8)	N.A.
TOTAL	44.5 (100.0)	40.9 (100.0)	35.0 (100.0)	35.0 (100.0)	38.6 (100.0)	47.1 (100.0)	89.7* (100.0)	N.A.

\*Estimated

N.A. - Not available

Source: Tropical Products Quarterly,  
March, 1968.

contd...

TABLE NO.5 (contd.)

B93

	1960	1961	1962	1963	1964	1965	1966	1967
UNIT VALUE (in Rs. '000 per tonne)								
India	19.5	15.2	12.5	13.4	14.3	26.1	45.6	47.4
Ceylon	22.5	20.0	16.0	15.3	16.4	29.3	51.5	N.A.
Guatemala	7.1	11.7	17.8	11.1	12.8	17.0	34.5	N.A.
Thailand	7.5	6.7	26.7	22.2	31.8	28.6	46.7	N.A.



TABLE NO.6

## THE TOP FOURTEEN IMPORTERS OF INDIAN CARDAMOM

S. No.	Country	Import of Indian Cardamom (tonnes)			Share in Total Indian Export (Percent)		
		1965-66	1966-67	April 1967-Feb. 1968	1965-66	1966-67	April 1967-Feb. 1968
1.	Kuwait	267	394	443	19.2	22.8	33.3
2.	Saudi Arabia	358	365	277	25.7	21.2	20.8
3.	U.S.S.R.	36	108	95	2.6	6.3	7.1
4.	Qtr. Trl. Omn.	52	42	65	3.7	2.4	4.9
5.	Finland	77	69	61	5.5	4.0	4.6
6.	Sweden	22	117	59	1.6	6.8	4.4
7.	Singapore & Malaya	53	65	41	3.8	3.8	3.1
8.	Bahrain Is.	22	58	35	1.6	3.4	2.6
9.	German Democratic Republic	7	29	24	0.5	1.7	1.8
10.	Iran	23	36	21	1.6	2.1	1.6
11.	U.K.	26	36	21	1.8	2.1	1.6
12.	Belgium	11	39	21	0.8	2.3	1.6
13.	Aden	11	38	14	0.8	2.2	1.0
14.	Afghanistan	152	98	*	10.9	5.7	*
15.	Other countries	275	230	154	19.9	13.2	11.6
TOTAL		1392	1724	1331	100.0	100.0	100.0

\*Included in others.

Source: Monthly Statistics of the Foreign Trade of India.

TABLE NO.6-A

COUNTRYWISE EXPORTS OF CARDAMOM FROM INDIA

Exported to	(in metric tonnes)							
	1960	1961	1962	1963	1964	1965	1966	1967
Saudi Arabia	490	492	627	542	414	293	295	384
Kuwait	208	190	257	323	435	250	287	495
U.S.S.R.	93	82	110	147	180	40	125	27
Afghanistan	53	42	13	28	45	134	115	11
Sweden	213	303	294	176	167	36	105	69
Malaysia & Singapore	26	19	17	24	19	38	79	40
Finland	52	82	61	67	95	62	67	85
Bahrain	175	132	87	65	33	24	35	49
Japan	27	28	19	23	20	11	29	27
Iran	43	48	76	35	31	23	26	26
U.K.	37	52	50	40	46	26	26	31
Netherlands	16	21	26	25	18	17	19	19
East Germany	16	6	35	37	25	15	18	21
Denmark	12	22	20	14	17	11	17	16
West Germany	41	68	55	32	68	20	17	30
Norway	9	24	30	13	20	9	17	24
Iraq	29	26	44	31	28	5	17	14
U.S.A.	28	36	40	8	26	3	15	18
Sudan	6	23	21	28	15	2	12	**
Kenya	13	14	23	16	15	13	6	6
Pakistan	199	257	268	259	242	171	-	-
Middle East countries*	83	101	104	108	84	72	59	87
Others	48	186	108	85	95	77	80	78
TOTAL	1917	2254	2385	2126	2138	1352	1466	1557

\*Qatar, Trucial Oman, Muscat, Aden and Yemen.

\*\*Included in "others".

Sources: 1. The Tropical Products Quarterly, March 1968  
 2. Data for 1967 from Monthly Statistics of the Foreign Trade of India.



TABLE NO.6-B

UNIT VALUES OF INDIA'S EXPORTS OF CARDAMOM,  
BY TYPES, 1964-65 to 1966-67

S. No.	Type of cardamom	Unit values - Rs.per tonne				
		1964-65	1965-66	1966-67	Difference bet-	
					ween 1964-65 & 1966-67	
					Actual	% increase
1.	Cardamom small Alleppey Green	19265	39133	50204	+30939	+160.6
2.	Cardamom small Coorg Green	15883	35111	44267	+28384	+178.7
3.	Cardamom large	4591	6475	13015	+ 8424	+183.5
4.	Cardamom small. - bleached or bleach- able	18406	37717	48374	+29968	+162.8
5.	Cardamom small seeds	17726	37981	65241	+47515	+268.0
6.	Cardamom small others	11727	10846	41695	+29968	+255.5
TOTAL (Average)		16143	31566	47266	+31123	+192.8

TABLE NO. 7

INDIA'S EXPORTS OF CARDAMOM, TYPEWISE(1964-65 to 1966-67)(Q. Quantity in tonnes)  
(V. Value in '000 Rs.)

S. No.	Type of Cardamom	1964-65		1965-66	
		Q.	V.	Q.	V.
1.	Cardamom small Alleppey Green	948 (54.0)	18263 (64.4)	821 (59.1)	32128 (73.2)
2.	Cardamom small Coorg Green	197 (11.2)	3129 (11.0)	117 (8.4)	4108 (9.4)
3.	Cardamom large	257 (14.6)	1180 (4.2)	257 (18.5)	1664 (3.8)
4.	Cardamom small - bleached or bleachable	138 (7.9)	2540 (9.0)	92 (6.6)	3470 (7.8)
5.	Cardamom small seeds	117 (6.7)	2074 (7.3)	52 (3.7)	1975 (4.5)
6.	Cardamom small others	99 (5.6)	1161 (4.1)	52 (3.7)	564 (1.3)
		1756 (100.0)	28347 (100.0)	1391 (100.0)	43909 (100.0)

S. No.	Type of cardamom	1966-67	
		Q.	V.
1.	Cardamom small Alleppey Green	1231 (71.8)	61801 (76.2)
2.	Cardamom small Coorg Green	120 (7.0)	5312 (6.6)
3.	Cardamom large	132 (7.7)	1718 (2.1)
4.	Cardamom small - bleached or bleachable	91 (5.3)	4402 (5.4)
5.	Cardamom small seeds	83 (4.8)	5415 (6.7)
6.	Cardamom small others	59 (3.4)	2460 (3.0)
		1716 (100.0)	81108 (100.0)



TABLE NO.8

DIRECTION OF INDIA'S EXPORTS OF ALLEPPEY GREENSMALL CARDAMOM.(1964-65 to 1966-67)(Q. - Quantity in tonnes)  
(V. - Value in '000 Rs.)

Country exported to	1964-65		1965-66		1966-67	
	Q.	V.	Q.	V.	Q.	V.
Saudi Arabia	324.5	6821	355.1	14969	360.5	18687
Kuwait	281.9	5817	255.6	10345	360.0	18724
U.S.S.R.	34.3	590	-	-	86.0	3351
Sweden	74.0	1073	8.7	208	64.0	3032
Bahrain Is.	22.8	511	19.2	827	54.8	2843
Qtr. Trl. Omn.	20.3	444	35.7	1469	36.0	2147
Finland	6.4	177	12.5	496	31.5	2053
Aden	15.4	267	3.7	138	27.0	1307
Belgium	2.0	30	0.7	23	25.1	1119
West Germany	14.8	202	6.0	119	23.8	918
Denmark	2.3	49	9.8	300	20.6	861
Afghanistan	3.1	49	55.1	1342	19.2	900
Norway	15.0	193	8.0	226	18.2	722
U.S.A.	1.5	19	-	-	15.1	833
U.K.	11.4	235	10.3	360	13.8	606
Netherlands	4.3	80	7.2	226	13.7	505
Japan	7.6	119	4.4	164	13.5	666
Iraq	8.1	116	2.8	107	12.0	577
Others	98.2	1471	26.3	809	36.5	1950
TOTAL	947.9	18263	821.1	32128	1231.3	61801

Source: Monthly Statistics of the Foreign Trade of India.

TABLE NO.9

DIRECTION OF INDIA'S EXPORTS OF LARGE CARDAMOM  
(1964-65 to 1966-67)

(Q. - Quantity in Tonnes)

(V. - Value in '000 Rs.)

Country exported to	1964-65		1965-66		1966-67	
	Q.	V.	Q.	V.	Q.	V.
Afghanistan	32.3	146	79.6	486	66.0	868
Malaysia & Singapore	5.2	30	37.3	259	34.0	429
U.K.	11.4	59	7.7	53	9.0	115
Iran	1.0	5	4.3	25	7.0	75
Finland	2.1	20	6.2	74	3.0	60
Kenya	3.0	15	7.5	48	2.5	31
U.S.A.	2.0	15	4.1	50	2.0	45
Pakistan	169.9	749	82.4	479	-	-
Others	29.8	141	28.2	190	8.4	95
TOTAL	256.7	1180	257.3	1664	131.9	1718

Source: Monthly Statistics of the Foreign Trade of India.



TABLE NO. 10

DIRECTION OF INDIA'S EXPORT OF CARDAMOM SMALL  
BLEACHED OR BLEACHABLE

(1964-65 to 1966-67)

(Q: Quantity in Tonnes)

(V: Value in '000 Rs.)

Country exported to	1964-65		1965-66		1966-67	
	Q.	V.	Q.	V.	Q.	V.
Iran	13.8	223	13.4	458	21.5	942
Malaysia and Singapore	8.6	120	13.8	293	16.8	698
U.K.	2.9	74	4.7	191	8.1	449
Sweden	1.8	26	3.8	154	7.5	405
Finland	13.5	269	19.6	859	6.0	355
France	2.8	50	4.9	184	5.7	262
Kenya	7.1	105	4.0	133	3.5	156
Kuwait	9.2	226	0.8	29	3.0	137
Others	78.4	1447	27.0	1169	19.2	998
TOTAL	138.1	2540	92.0	3470	91.3	4402

Source: Monthly Statistics of the Foreign Trade of India.

TABLE NO. 11DIRECTION OF INDIA'S EXPORTS OF COORG GREEN SMALLCARDAMOM, 1964-65 to 1966-67

(Q.-Quantity in Tonnes)

(V.-Value in '000 Rs.)

Country exported to	1964-65		1965-66		1966-67	
	Q.	V.	Q.	V.	Q.	V.
Sweden	21.1	397	6.8	222	29.3	1235
U.S.S.R.	27.3	476	20.5	764	21.4	925
Afghanistan	0.3	4	14.2	530	11.9	553
Japan	5.3	77	9.2	312	11.3	492
Belgium	2.2	38	9.4	278	6.5	259
Iraq	4.7	58	1.8	61	6.3	274
Netherlands	2.6	33	13.0	455	5.6	239
Saudi Arabia	34.3	538	2.7	84	4.2	234
Qtr. Trl. Omn.	0.5	9	6.2	237	3.3	172
Aden	3.2	54	4.8	150	2.5	110
Bahrain	1.5	30	1.8	58	2.4	122
Others	94.5	1415	26.4	957	15.5	697
TOTAL	197.5	3129	116.8	4108	120.2	5312

Source: Monthly Statistics of the Foreign Trade of India.



TABLE NO.12

DIRECTION OF INDIA'S EXPORTS OF CARDAMOMSMALL SEEDS, 1964-65 to 1966-67

(Q. - Quantity in tonnes)

(V. - Value in '000 Rs.)

Country exported to	1964-65		1965-66		1966-67	
	Q.	V.	Q.	V.	Q.	V.
East Germany	11.1	400	7.0	296	24.4	1577
Finland	32.7	557	29.0	1159	24.1	1580
Sweden	27.7	462	1.6	67	15.1	1059
Belgium	1.0	18	0.9	26	6.4	411
U.K.	5.5	74	1.7	64	3.8	231
U.S.A.	4.2	46	-	-	3.5	242
Iran	-	-	-	-	1.7	70
Others	34.7	517	11.8	363	4.0	245
TOTAL	116.9	2074	52.0	1975	83.0	5415

Source: Monthly Statistics of the Foreign Trade of India.

TABLE NO. 13

PER CAPITA CONSUMPTION OF CARDAMOM IN MAJOR  
CONSUMING COUNTRIES

(Grams per head per year)

	1937-39 (a)*	1950-53 (a)*	1954-58 (a)*	1957-60 **
<u>Developed Countries</u>				
West Germany	1.19	0.45	0.91	1.37
Sweden	24.49	19.96	29.94	33.93
Finland	-	-	11.79	19.42
U.K.	0.91	0.45	0.45	N.A.
Denmark	-	-	-	N.A.
Norway	-	-	-	N.A.
U.S.A.	0.91	0.45	0.45	0.40
U.S.S.R.	N.A.	N.A.	N.A.	0.43

Developing Countries

Arabian countries (b) (Middle East)	-	-	-	67.73
Iran	-	1.36	1.36	2.39
Pakistan	N.A.	N.A.	N.A.	0.48
India	N.A.	N.A.	N.A.	2.56(c)
Ceylon	N.A.	N.A.	N.A.	150.10(d)

1959-62 *	1961-63 **	1963-66 *
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Developed Countries

West Germany	1.30	1.46	1.19
Sweden	37.46	40.73	34.51
Finland	22.57	23.97	26.33
U.K.	-	N.A.	0.74
Denmark	6.60	N.A.	6.99
Norway	8.90	N.A.	9.64
U.S.A.	0.42	0.38	0.35
U.S.S.R.	N.A.	0.48	N.A.

Developing Countries

Arabian countries (b) (Middle East)	75.00	90.62	72.00
Iran	3.34	2.78	1.48
Pakistan	N.A.	1.44	N.A.
India	N.A.	2.45	N.A.
Ceylon	N.A.	119.22	N.A.

Source: \*Tropical Products Quarterly, March 1968.

\*\*F.A.O. Rome.

Notes: (a) From F.A.O. Spices, Trends in World Markets 1962.  
 (b) Saudi Arabia, Bahrain, Kuwait, Qatar, Trucial Oman  
 Muscat Aden and Yemen. (c) Average for 1960.  
 (d) Average for 1959-60. (N.A. - Not available)



TABLE NO. 14

CARDAMOM (SMALL): WHOLESALE PRICES (AT ALLEPPEY)

(Rs. per quintal)							
Month	1957	1958	1959	1960	1961	1962	
January	-	2250.07	2143.52	2357.87	2140.14	1926.00	
February	-	2143.52	2143.52	2250.70	2140.14	1926.00	
March	2411.46	2143.52	2143.52	2250.70	2140.14	1926.00	
April	2357.87	2143.52	2143.52	2572.22	2140.14	1926.00	
May	2357.87	2143.52	2143.52	2250.70	2140.14	1926.00	
June	2143.52	2143.52	2143.52	2250.70	2140.14	1872.00	
July	2143.52	2197.11	2250.70	2143.52	2140.14	1872.00	
August	2357.87	2197.11	2250.70	2143.52	2010.14	1872.00	
September	2465.05	2143.52	2465.05	2357.87	2033.13	1872.00	
October	2465.05	2250.70	2357.87	2357.87	-	1872.00	
November	2465.05	2250.70	2357.87	2250.70	2033.13	2033.00	
December	2357.87	2143.52	2357.87	2143.52	2140.00	2033.00	

(Rs. per quintal)					
Month	1963	1964	1965	1966	1967
January	2033.00	1600.00	3500.00	5400.00	5500.00
February	NQ	1600.00	3500.00	NQ	6000.00
March	1500.00	1600.00	3500.00	6700.00	5600.00
April	1500.00	1600.00	3500.00	5500.00	6000.00
May	1500.00	1600.00	3500.00	5000.00	5400.00
June	1500.00	1600.00	3500.00	6000.00	5400.00
July	1500.00	1600.00	3500.00	6000.00	5500.00
August	1500.00	1600.00	3500.00	5500.00	N.R.
September	1500.00	1600.00	3500.00	5500.00	
October	1500.00	1600.00	3500.00	6000.00	
November	1800.00	1600.00	4500.00	5400.00	
December	1600.00	3200.00	5000.00	5200.00	

NQ - Not quoted.

NR - Not Reported.



TABLE NO. 15

## CARDAMOM - PRICE STATISTICS

(Rs. per Kg.)

Month	1965-66				
	(a)	(b)	F.O.B.	Spot Price (London)	
			prices average	Al. Green	C. Green
April	29.27	29.50	24.58	29.33	
May	29.35	29.96	24.78	29.33	
June	29.85	30.00	23.91	29.09	
July	29.85	30.00	22.66	28.97	
August	29.85	30.00	11.24	29.33	
September	32.65		28.66	30.80	
October	33.11		34.73	35.20	
November	40.06		33.59	44.00	
December	40.29		26.88	47.67	
January	42.40	45.69	38.04	44.73	46.20
February	51.90	55.78	40.66	45.83	46.20
March	52.73	59.33	50.43	-	51.33

Month	1966-67				
	(a)	(b)	F.O.B.	Spot Price (London)	
			prices Average	Al. Green	C. Green
April	-	52.84	53.58	-	49.13
May	48.96	46.90	41.10	47.66	47.66
June	50.96	48.10	51.51	68.22	-
July	52.86	50.37	50.50	75.08	68.43
August	52.50	49.30	44.15	75.08	65.84
September	52.76	49.50	44.81	75.08	65.84
October	49.17	45.77	45.58	51.98	63.53
November	45.24	42.37	49.85	51.69	63.53
December	47.46	44.61	45.61	50.82	58.91
January	48.63	46.81	48.34	50.82	57.75
February	47.00	45.50	46.89	49.09	54.29
March	N.A.	N.A.	47.42	48.51	-

- Notes: (a) Market Prices at Bodinayakanur for cardamom - Extra Green.  
 (b) Market Prices at Bombay for cardamom - Medium.  
 (c) Market Prices at Bombay for cardamom - Ordinary Green.

Sources: for (a), (b) and (c) - The Economic Times, Bombay.  
 for F.O.B. Prices - D.G.C.I.S., Calcutta and  
 Customs Daily Lists.  
 London market prices - The Public Ledger and The  
 High Commission of India, London.



TABLE NO. 15 (contd.)

CARDAMOM - PRICE STATISTICS

Month	(Rs. per Kg.)				
			1967-68	Spot Price (London)	
	(a)	(b)	F.O.B. prices Average	Al. Green	C. Green
April	42.92	41.00	50.37	45.62	45.62
May	45.56	43.10	42.19	43.89	43.89
June	43.72	42.08	47.01	42.74	43.89
July	45.06	43.12	42.50	42.74	43.89
August	45.00	42.12	42.77	42.74	43.89
September					
October					
November					
December					
January					
February					
March					

Notes: (a) Market Prices at Bodinayakanur for cardamom - Extra Green.

(b) Market Prices at Bombay for cardamom - Medium.

(c) Market Prices at Bombay for cardamom - Ordinary Green.

Sources: for (a), (b) and (c) - The Economic Times, Bombay.  
for F.O.B. Prices - D.G.C.I.S., Calcutta and  
Customs Daily Lists.

London market prices - The Public Ledger and  
The High Commission of India, London.

TABLE NO. 16WORLD PRODUCTION OF CARDAMOM AND INDIA'S SHARE

(in thousand tonnes)

Year	India	Guatemala Ceylon and Thailand	Total	Production in India as percent of total world production
1956	2.9	2.7	5.6	51.8
1957	2.8	2.6	5.4	51.8
1958	3.1	2.7	5.8	53.4
1959	3.3	1.8	5.1	64.7
1960	3.2	2.1	5.3	60.4
1961	3.2	1.5	4.7	68.1
1962	3.4	2.0	5.4	63.0
1963	4.1	2.0	6.1	67.2
1964	2.2	1.9	4.1	53.6
1965	2.0	2.1	4.1	48.8
1966	2.7	2.1	4.8	56.2
1970*	3.0	2.2	5.4	55.6
1975*	3.5	2.6	6.1	57.4
Total 1956 to 1966	32.9	23.5	56.4	58.3
Average per year 1956- 1966	3.0	2.1	5.1	58.8

\*Estimates.



TABLE NO. 16-ACOUNTRYWISE EXPORTS OF CEYLON CARDAMOM

Country exported to	(in tonnes)							
	1960	1961	1962	1963	1964	1965	1966	1967
U.K.	3.2	2.2	1.5	0.9	1.7	4.9	4.7	6.3
Aden	10.4	6.5	5.4	6.6	-	8.2	4.1	1.8
Bahrain Is.	1.6	0.6	-	5.8	1.3	3.7	2.7	1.9
Kuwait	-	-	9.4	6.3	5.8	12.0	14.9	13.4
Maldiva Is.	0.4	0.9	0.3	-	0.1	0.2	0.1	0.1
Mauritius	0.8	2.2	1.6	1.4	2.2	0.3	1.8	1.2
Pakistan	0.1	0.3	0.3	2.4	3.6	2.2	2.7	0.5
Singapore	-	-	2.0	2.6	8.5	-	3.3	6.2
South Africa	1.2	1.4	2.0	2.6	1.5	0.9	1.5	-
Saudi Arabia	68.8	52.6	44.8	51.1	29.7	34.9	21.3	29.9
Iraq	1.5	1.1	2.0	5.0	0.3	4.7	11.1	4.0
Japan	1.8	3.4	2.5	3.0	1.5	1.5	1.4	2.0
Jordan	28.8	26.6	48.5	26.7	42.2	17.8	35.1	33.1
Lebanon	7.0	12.4	5.4	11.5	7.5	7.9	5.6	8.9
Sudan	0.2	10.6	2.7	1.2	2.6	0.9	1.1	-
Syria	9.4	8.8	21.3	14.5	18.2	5.9	5.6	2.1
U.A.R.	0.8	3.3	2.6	2.7	10.4	1.0	1.7	1.1
U.S.A.	6.5	10.2	0.5	5.8	4.9	9.0	6.8	5.2
Others	19.2	16.8	0.9	4.7	0.1	27.0*	1.3	6.4
TOTAL	161.7	159.9	153.7	154.8	142.1	143.0	126.8	124.1

\*25.6 exported to Malaysia.

Source: The Ceylon Chamber of Commerce, Annual Report & Accounts 1967; Reproduced from Ceylon Customs Returns.





TABLE NO. 17

THE PATTERN OF EXPORTS OF CARDAMOM FROM PRODUCER  
COUNTRIES - 1963

(in Tonnes)					
Country exported to	From Producer Country				Total*
	India	Ceylon	Guatemala	Thailand	
Saudi Arabia	542	51	91	-	684
Kuwait	323	6	-	-	329
Bahrain	65	6	-	-	71
Other Middle East Countries**	108	7	-	-	115
Sweden	176	-	84	-	260
Finland	67	-	34	-	101
Norway	13	-	14	-	27
Denmark	14	-	16	-	30
West Germany	32	-	68	-	100
U.K.	40	1	1	-	42
Jordan	-	27	-	-	27
Lebanon	-	12	-	-	12
Malaysia & Singapore	24	3	-	N.A.	27
U.S.A.	8	6	63	-	77
U.S.S.R.	147	-	-	-	147
Others	567	36	2	N.A.	605
TOTAL	2126	155	373	N.A.	2654

\* Excludes exports from Thailand.

\*\*Includes Qatar, Trucial Oman, Muscat, Aden and Yemen.

TABLE NO. 18

THE PATTERN OF EXPORTS OF CARDAMOM FROM PRODUCER  
COUNTRIES - 1964

(in tonnes)					
Country exported to	From Producer Country				TOTAL
	India	Ceylon	Guatemala	Thailand	
Saudi Arabia	414	30	137	-	581
Kuwait	435	6	-	-	441
Bahrain	33	1	-	-	34
Other Middle East Countries**	95	-	-	-	95
Sweden	167	-	94	-	261
Finland	95	-	31	-	126
Norway	20	-	9	-	29
Denmark	17	-	15	-	32
West Germany	68	-	52	-	120
U.K.	46	2	-	-	48
Jordan	-	42	-	-	42
Lebanon	-	7	-	-	7
Malaysia & Singapore	19	9	-	16	44
U.S.A.	26	5	51	-	82
U.S.S.R.	180	-	-	-	180
Others	523	40	4	209*	776
TOTAL	2138	142	393	225	2898

\*\*Includes Qatar, Trucial Oman, Muscat, Aden and Yemen.

\*209 tonnes to Hong Kong.



TABLE NO. 19

THE PATTERN OF EXPORTS OF CARDAMOM FROM PRODUCER  
COUNTRIES - 1965

Country exported to	(in Tonnes)				TOTAL
	From India	From Ceylon	From Guatemala	From Thailand	
Saudi Arabia	293	35	142	-	470
Kuwait	250	12	-	-	262
Bahrain	24	4	-	-	28
Other Middle East Countries**	72	8	-	-	80
Sweden	36	-	94	-	130
Finland	62	-	24	-	86
Norway	9	-	16	-	25
Denmark	11	-	13	-	24
West Germany	20	-	80	-	100
U.K.	26	5	1	-	32
Jordan	-	18	-	-	18
Lebanon	-	8	-	-	8
Malaysia & Singapore	38	-	-	N	38
U.S.A.	3	9	52	-	64
U.S.S.R.	40	-	-	-	40
Others	468	44	6	142*	660
TOTAL	1352	143	428	142	2065

\*\*Includes Qatar, Trucial Oman, Muscat, Aden and Yemen.

\*141 tonnes to Hong Kong.

TABLE NO. 20

THE PATTERN OF EXPORTS OF CARDAMOM FROM PRODUCER  
COUNTRIES - 1966

(in tonnes)					
Country exported to	From Producer Country				TOTAL@
	India	Ceylon	Guatemala	Thailand*	
Saudi Arabia	295	21	79	-	395
Kuwait	287	15	-	-	302
Bahrain	35	3	46	-	84
Other Middle East Countries**	59	4	-	-	63
Sweden	105	-	137	-	242
Finland	67	-	48	-	115
Norway	17	-	2	-	19
Denmark	17	-	18	-	35
West Germany	17	-	53	-	70
U.K.	26	5	1	-	32
Jordan	-	35	-	-	35
Lebanon	-	6	-	-	6
Malaysia & Singapore	79	3	-	1	83
U.S.A.	15	7	43	-	65
U.S.S.R.	125	-	-	-	125
Others	322	28	16	95(a)	461
TOTAL	1466	127	443	96	2132

\*\*Includes Qatar, Trucial Oman, Yemen, Muscat and Aden.

\*January to November, 1966.

@Total includes Thailand exports for January to November only.

(a) 93 tonnes to Hong Kong.



TABLE NO. 21

THE PATTERN OF EXPORTS OF CARDAMOM FROM PRODUCER  
COUNTRIES - 1967

Country exported to	(in Tonnes)				Total@
	From India	From Ceylon	From Guatemala	From Thailand	
Saudi Arabia	384	30	48	-	462
Kuwait	495	13	-	-	508
Bahrain	49	2	37	-	88
Other Middle East Countries**	87	2	11	-	100
Sweden	69	-	83	-	152
Finland	85	-	23	-	108
Norway	24	-	-	-	24
Denmark	16	-	3	-	19
West Germany	30	-	33	-	63
U.K.	31	6	-	-	37
Jordan	(a)	33	-	-	33
Lebanon	(a)	9	-	-	9
Malaysia & Singapore	40	6	-	N.A.	46
U.S.A.	18	5	86	-	109
U.S.S.R.	27	-	-	-	27
Others	202	18	5	N.A.	225
TOTAL	1557	124	329	N.A.	2010

\*January to May.

@ Total includes January to May figures only for Guatemala exports and excludes Thai exports.

\*\*Includes Qatar, Aden, Yemen, Muscat and Trucial Oman.

TABLE NO. 22

INDIA'S PEAK YEAR - EXPORTS OF CARDAMOM1963-64

Total Exports - Quantity : 2310 tonnes.

Value : Rs.32  
millions.

S. No.	Country	Quantity		Value (in '000 Rs.)
		Tonnes	% share	
1.	Saudi Arabia	566	24.5	9415
2.	Kuwait	389	16.8	6184
3.	Pakistan	290	12.5	1477
4.	Sweden	173	7.5	2288
5.	U.S.S.R.	154	6.7	2941
6.	Finland	80	3.5	1123
7.	Aden	62	2.7	855
8.	Bahrain Is.	59	2.5	930
9.	Qtr. Trl. Omn.	51	2.2	751
10.	Iraq	42	1.8	572
11.	U.K.	43	1.8	501
12.	West Germany	41	1.8	428
13.	Iran	40	1.7	476
14.	Afghanistan	36	1.6	400
15.	East Germany	36	1.6	638
16.	Sudan	30	1.3	302
17.	Malaya & Singapore	26	1.1	253
18.	Netherlands	25	1.1	309
19.	U.S.A.	24	1.0	342
20.	Japan	23	1.0	315
21.	Denmark	16	0.7	210
22.	Kenya	15	0.6	159
23.	Norway	13	0.6	165
24.	Others	77	0.6	165
TOTAL		2310	100.0	31999



TABLE NO. 23

INDIA'S PERFORMANCE ON EXPORTS OF CARDAMOM  
1966-67

Total Exports - Quantity in Tonnes - 1724

S. No.	Country	Quantity		Value (in '000 Rs.)
		Actual (Tonnes)	% share	
1.	Kuwait	394	22.8	20262
2.	Saudi Arabia	365	21.2	18943
3.	Sweden	117	6.8	5793
4.	U.S.S.R.	106	6.3	4331
5.	Afghanistan	98	5.7	2147
6.	Finland	69	4.0	4272
7.	Malaya & Singapore	65	3.8	1559
8.	Bahrain Is.	58	3.4	2970
9.	Qtr. Trl. Omn	42	2.4	2390
10.	Belgium	39	2.3	1846
11.	Aden	38	2.2	1819
12.	Iran	36	2.1	1370
13.	U.K.	36	2.1	1413
14.	West Germany	29	1.7	1153
15.	East Germany	29	1.7	1844
16.	Japan	28	1.6	1270
17.	U.S.A.	24	1.4	1295
18.	Denmark	22	1.3	891
19.	Netherlands	20	1.2	763
20.	Iraq	20	1.2	860
21.	Norway	19	1.1	773
22.	Sudan	12	0.7	596
23.	Others	58	3.0	2477
TOTAL		1724	100.0	81037

TABLE NO. 24

THE PATTERN OF INDIA'S EXPORTS OF CARDAMOM 1960-61  
TO APRIL 1967 - FEBRUARY 1968 AND PROJECTIONS FOR  
1970-71 AND 1975-76

	(Quantity in Tonnes)				
	1960-61	1961-62	1962-63	1963-64	1964-65
Middle East*	752 (36.9)	1004 (43.9)	969 (42.3)	1127 (48.8)	787 (44.7)
Other Middle East†	290	117	136	130	57
SUB-TOTAL	1042 (51.2)	1121 (49.0)	1105 (48.3)	1257 (54.4)	844 (47.9)
Sweden	228 (11.2)	294 (12.9)	292 (12.7)	173 (7.5)	150 (8.5)
Eastern Europe (including USSR)	96 (4.7)	187 (8.2)	185 (8.1)	199 (8.6)	140 (7.9)
SUB-TOTAL	1366 (67.1)	1602 (70.1)	1582 (69.1)	1629 (70.5)	1134 (64.3)
All other countries	669	683	707	681	628

	(Quantity in Tonnes)				
	1965-66	1966-67	1967-68 (11 months)	** 1970-71	** 1975-76
Middle East*	710 (51.0)	897 (52.0)	834 (62.6)	1250 (54.3)	1450 (54.7)
Other Middle East	36	15			
SUB-TOTAL	746 (53.6)	972 (56.4)			
Sweden	22 (1.6)	117 (6.8)	59 (4.4)	240 (10.4)	300 (11.3)
Eastern Europe (including USSR)	51 (3.7)	147 (8.5)	119 (8.9)	200 (8.7)	250 (9.4)
SUB-TOTAL	819 (58.9)	1236 (71.7)	1012 (75.9)	1690 (71.4)	2000 (75.4)
All other countries	573	488	319	650@	700@

\*\*Projections. \*Saudi Arabia, Aden, Kuwait, Qtr. Omn. Bahrain.

† Iraq, Iran, Israel, Sudan etc. @Includes other Middle East countries.

Note: Figures in brackets indicate percentages.



TABLE NO. 24-ATOTAL IMPORTS OF CARDAMOM INTO SAUDI ARABIA

Year	Quantity (in metric tonnes)	Value in thousand dollars	Average unit value (in \$)
1960-61 (1380 AH)	679	(15240) 3394	4999
1961-62 (1381 AH)	670	(14267) 3177	4742
1962-63 (1382 AH)	846	( 9841) 2192	2591
1963-64 (1383 AH)	678	(10637) 2369	3494
1964-65 (1384 AH)	490	( 9102) 2027	4137
1965-66 (1385 AH)	487	(14441) 3216	6604
1966-67 (1386 AH)	494	(18036) 4017	8132

Source: Foreign Trade Statistics, Ministry of Finance and National Economy, Kingdom of Saudi Arabia.

Notes: 1. Figures in brackets are values in thousand rials.  
2. One Dollar = 4.49 Rials.

TABLE NO. 24-B

IMPORTS OF CARDAMOM INTO KUWAIT AND LOCAL  
CONSUMPTION

(Q: Quantity in M. tonnes)

(V: Value in '000 K.D.)

Imported from	1962		1963		1964	
	Q.	V.	Q.	V.	Q.	V.
India	273	278	396	438	490	599
Ceylon	5	5	7	9	5	7
Guatemala	-	-	-	-	-	-
Arabian Gulf	-	-	-	-	-	-
Others	-	-	1	1	1	N
TOTAL IMPORTS	278	283	404	448	496	606
RE-EXPORTS*	143	149	156	150	296	259
LOCAL CONSUMPTION	135	134	248	298	200	347

Imported from	1965		1966	
	Q.	V.	Q.	V.
India	278	641	306	921
Ceylon	9	22	15	52
Guatemala	3	7	N	1
Arabian Gulf	-	-	6	21
Others	5	11	1	2
TOTAL IMPORTS	295	681	328	997
RE-EXPORTS*	96	115	57	103
LOCAL CONSUMPTION	199	566	271	894

Source: Yearly Bulletins of Foreign Trade Statistics,  
Central Statistical Office, The Planning Board,  
Kuwait.

Notes: \*Most of the re-exports are to Saudi Arabia.



TABLE NO. 24-C

THE PATTERN OF OVERALL IMPORTS AND RE-EXPORTS  
IN RELATION TO SPICE IMPORTS AND RE-EXPORTS  
FOR BAHRAIN

Item	(Value in B.D.)	
	1966	1967
1. Total Imports	42,034,031	45,453,296
2. Spice Imports	900,547	1,028,502
3. Spice Imports as per cent of total imports (2) as % of (1)	2.14%	2.26%
4. Total re-exports	14,129,946	14,689,548
5. Spice-re-exports	763,030	1,008,113
6. Spice re-exports as per cent of total re-exports (5) as % of (4)	5.40%	6.86%
7. Spice re-exports as per cent of spice imports (5) as % of (2)	84.73%	98.02%
8. Total re-exports as per cent of total imports (4) as % of (1)	33.62%	32.32%

Source: Annual statistics of Imports and Exports, The British Political Agency, Bahrain.

TABLE NO. 24-D

SWEDEN'S IMPORTS OF CARDAMOM - COUNTRYWISE

Country imported from	Quantity (in Tonnes)					
	1962	1963	1964	1965	1966	1967
India	263	236	217	64	74	109
Guatemala	35	90	96	137	137	119
Tanzania	-	3	14	9	5	24
U.S.A.	-	-	N.A.	6	-	1
Indonesia	-	-	1	-	-	-
Belgium/Luxembourg	-	-	-	N.A.	-	10
Jamaica	-	-	-	-	2	-
Others (not accounted)	2	1	1	1	6	1
Total	300	330	329	217	224	264

contd.

Country imported from	Value (in '000 Kroners)					
	1962	1963	1964	1965	1966	1967
India	4163	3259	3309	1408	2807	3384
Guatemala	617	1312	1499	2801	4463	3619
Tanzania	-	34	161	171	130	532
U.S.A.	-	-	13	110	-	18
Indonesia	-	-	12	-	-	-
Belgium/Luxem- bourg	-	-	-	26	-	201
Jamaica	-	-	-	-	64	-
Others (not accounted)	33	7	3	13	288	26
Total	4813	4612	4997	4529	7752	7779

Source: The Embassy of Sweden, Delhi.Note: 1 Kr. is approximately Rs.1.45.



TABLE NO. 24-E

IMPORTS OF CARDAMOM SEED BY U.S.A.

Imported from	1962	1963	1964	1965	1966	1967
<u>QUANTITY</u> (metric tonnes)						
Guatemala	23.7	29.7	43.8	33.9	51.2	49.2
India	43.7	18.4	34.5	5.0	21.8	28.4
Ceylon	1.5	4.8	4.1	8.9	8.4	4.5
Costa Rica	0.2	0.6	0.4	2.2	5.6	2.4
Sweden	0.3	N	-	0.2	0.2	0.3
Salvador	-	0.7	0.4	0.3	0.1	0.1
Others	1.0	-	-	2.2	7.1	N
TOTAL	70.4	54.2	83.2	52.7	94.5	84.9
<u>VALUE</u> ('000 Dollars)						
Guatemala	91.2	80.2	135.9	190.4	358.0	317.4
India	168.2	78.3	123.6	40.8	183.7	235.5
Ceylon	3.9	12.2	10.9	41.0	53.5	18.9
Costa Rica	0.6	1.3	0.8	6.9	39.4	11.1
Sweden	1.8	0.5	-	1.3	2.8	2.7
Salvador	-	1.7	1.1	1.8	1.0	0.7
Others	4.4	-	-	10.2	42.9	0.5
TOTAL	270.1	174.2	272.3	292.4	681.3	586.8

Source: U.S. Government Statistics on U.S. General Imports and Imports for consumption.





TABLE NO. 25

THE PATTERN OF CARDAMOM PRODUCTION AND DIS-  
TRIBUTION IN INDIA'S PEAK YEAR - 1963

(in Tonnes)						
Producers	Importers				Estimated	Total
	Saudi Arabia	Kuwait	Other Middle East	Other Coun- tries	consump- tion in producer countries	
India	542 (79.2)	323 (98.2)	173 (93.0)	1088 (74.8)	1974 (59.5)	4100 (68.6)
Guatemala	91 (13.3)	-	-	282 (19.4)	-	373 (6.2)
Ceylon	51 (7.5)	6 (1.8)	13 (7.6)	85 (5.8)	1345 (40.5)	1500 (25.2)
TOTAL	684 (100.0)	329 (100.0)	186 (100.0)	1455 (100.0)	3319 (100.0)	5973 (100.0)

Note: Data presented is for the calendar year 1963; India's peak year of exports was 1963-64 as per financial year data.

Figures in brackets indicate percentages.

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TABLE NO. 26

THE PATTERN OF CARDAMOM PRODUCTION AND DISTRIBUTION1964

Producers	(in Tonnes)				Estimated consump- tion in producer countries	Total produc- tion
	Importers	Other		Other		
	Saudi Arabia	Kuwait	Middle East	Coun- tries		
India	414 (71.3)	435 (98.6)	128 (99.2)	1161 (76.2)	62 (5.1)	2200 (56.5)
Guatemala	137 (23.6)	-	-	256 (16.8)	-	393 (10.1)
Ceylon	30 (5.1)	6 (1.4)	1 (0.8)	106 (7.0)	1157 (94.9)	1300 (33.4)
TOTAL	581 (100.0)	441 (100.0)	129 (100.0)	1523 (100.0)	1219 (100.0)	3893 (100.0)

Note: Figures in brackets indicate percentages.



TABLE NO. 27

THE PATTERN OF CARDAMOM PRODUCTION AND DISTRIBUTION1965

(in Tonnes)						
Producers	Importers				Estimated	Total
	Saudi Arabia	Kuwait	Other Middle East	Other countries	consumption in producer countries	
India	293 (62.3)	250 (95.4)	96 (88.9)	713 (65.8)	648 (30.8)	2000 (49.6)
Guatemala	142 (30.2)	-	-	286 (26.4)	-	428 (10.6)
Ceylon	35 (7.5)	12 (4.6)	12 (11.1)	84 (7.8)	1457 (69.2)	1600 (39.8)
TOTAL	470 (100.0)	262 (100.0)	108 (100.0)	1083 (100.0)	2105 (100.0)	4028 (100.0)

Note: Figures in brackets indicate percentages.

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TABLE NO. 28

THE PATTERN OF CARDAMOM PRODUCTION AND DISTRIBUTION1966

(in Tonnes)						
Producers	Importers				Estimated	Total
	Saudi Arabia	Kuwait	Other Middle East	Other countries	consumption in producer countries	
India	295 (74.7)	287 (95.0)	94 (63.9)	790 (66.3)	1234 (47.3)	2700 (58.1)
Guatemala	79 (20.0)	-	46 (31.3)	318 (26.7)	-	443 (9.5)
Ceylon	21 (5.3)	15 (5.0)	7 (4.8)	84 (7.0)	1373 (52.7)	1500 (32.4)
TOTAL	395 (100.0)	302 (100.0)	147 (100.0)	1192 (100.0)	2607 (100.0)	4643 (100.0)

Note: Figures in brackets indicate percentages.



TABLE NO. 29

THE PATTERN OF CARDAMOM PRODUCTION & DISTRIBUTION1967

(in tonnes)						
Producers	Importers				Estimated	Total
	Saudi Arabia	Kuwait	Other Middle East	Other countries	consumption in producer countries	
India	384 (83.1)	495 (97.4)	136 (72.3)	542 (63.6)	1443 (47.0)	3000** (59.1)
Guatemala	48 (10.4)	-	48 (25.5)	233 (27.3)	-	329* (6.5)
Ceylon	30 (6.5)	13 (2.6)	4 (2.2)	77 (9.1)	1626 (53.0)	1750** (34.4)
TOTAL	462 (100.0)	508 (100.0)	188 (100.0)	852 (100.0)	3069 (100.0)	5079 (100.0)

\*January to May 1967 only.

\*\*Estimated

Note: Figures in brackets indicate percentages.

TABLE NO. 30THE PATTERN OF CARDAMOM PRODUCTION AND DISTRIBUTION1971 (Estimates)

(in tonnes)						
Producers	Importers				Estimated	Total production
	Saudi	Other	Other	consump-		
	Arabia	Kuwait	Middle	tion in		
		East	tries	producer		
				countries		
India	650 (81.2)	450 (97.8)	150 (68.2)	1050 (71.4)	700 (31.1)	3000 (57.7)
Guatemala	100 (12.5)	-	50 (22.7)	300 (20.4)	-	450 (8.6)
Ceylon	50 (6.3)	10 (2.2)	20 (9.1)	120 (8.2)	1550 (68.9)	1750 (33.7)
TOTAL	800 (100.0)	460 (100.0)	220 (100.0)	1470 (100.0)	2250 (100.0)	5200 (100.0)

Note: Figures in brackets indicate percentages.



TABLE NO.31

THE PATTERN OF CARDAMOM PRODUCTION AND DISTRIBUTION1975-76 (Estimates)

(in Tonnes)						
Producers	Importers				Estimated	Total
	Saudi Arabia	Kuwait	Other Middle East	Other countries	consumption in producer countries	
India	750 (79.0)	500 (96.2)	200 (71.4)	1200 (71.0)	850 (32.6)	3500 (57.9)
Guatemala	100 (10.5)	-	50 (17.9)	300 (17.8)	-	450 (7.4)
Ceylon	100 (10.5)	20 (3.8)	30 (10.7)	170 (10.0)	1680 (64.4)	2000 (33.0)
Thailand	-	-	-	20 (1.2)	80 (3.0)	100 (1.7)
TOTAL	950 (100.0)	520 (100.0)	280 (100.0)	1690 (100.0)	2610 (100.0)	6050 (100.0)

Note: Figures in brackets indicate percentages.

TABLE NO. 32

INDIA'S SHARE IN TOTAL WORLD EXPORTS OF CARDAMOM  
TO SELECTED COUNTRIES, 1963-1967 AND PROJECTIONS  
FOR 1971 & 1976

Importer	(Percentages)						
	1963	1964	1965	1966	1967	1971*	1976*
Saudi Arabia	59.2	71.3	62.3	74.7	83.1	81.2	79.0
Kuwait	98.2	98.6	95.4	95.0	97.4	97.8	96.2
Other Middle East	93.0	99.2	88.9	63.9	72.3	68.2	71.4
Other countries	74.8	76.2	65.8	66.3	63.6	71.4	71.0

\*Estimates.



TABLE NO.33

GUATEMALA'S SHARE IN TOTAL WORLD EXPORTS OF  
CARDAMOM TO SELECTED COUNTRIES, 1963-1967  
AND PROJECTIONS FOR 1971 AND 1976

Importer	(Percentages)						
	1963	1964	1965	1966	1967	1971*	1976*
Saudi Arabia	13.3	23.6	30.2	20.0	10.4	12.5	10.5
Kuwait	-	-	-	-	-	-	-
Other Middle East	-	-	-	31.3	22.5	22.7	17.9
Other countries	19.4	16.8	26.4	26.7	27.3	20.4	17.8

\*Estimates.

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TABLE NO.34

CEYLON'S SHARE IN TOTAL WORLD EXPORTS OF CARDAMOM  
TO SELECTED COUNTRIES, 1963-1967 AND PROJECTIONS  
FOR 1971 AND 1976

(Percentages)							
Importers	1963	1964	1965	1966	1967	1971*	1976*
Saudi Arabia	7.5	5.1	7.5	5.3	6.5	6.3	10.5
Kuwait	1.8	1.4	4.6	5.0	2.6	2.2	3.8
Other Middle East	7.0	0.8	11.1	4.8	2.2	9.1	10.7
Other countries	5.8	7.0	7.8	7.0	9.1	8.2	10.0

\*Estimates.



TABLE NO. 35

IMPORTS OF CARDAMOM INTO DIFFERENT COUNTRIES  
(1957 - 1967)

(in metric tonnes)						
Country	1957	1958	1959	1960	1961	1962
<u>WESTERN EUROPE</u>						
Sweden	248	246	249	285	322	300
Finland	82	67	89	104	99	110
West Germany	50*	50*	50*	58	75	92
Norway	22	29	32	27	33	36
Denmark	28	29	36	29	40	33
Belgium	5*	5*	5*	6	3	5
Netherlands	20*	20*	20*	19	19	21
France	9	6	-	4	9	8
Spain	3*	3*	3*	3	5	4
Italy	1	3	1	4	7	5
Sub-Total	468	458	485	539	612	614
<u>EASTERN EUROPE</u>						
East Germany	6	10	10	16	31	36
Czechoslovakia	1	1	2	5	4	7
Bulgaria	2	1	7	6	13	2
U.S.S.R.	64	85	122	92	90	102
Sub-Total	73	97	141	119	138	147
Country	1963	1964	1965	1966	1967	
<u>WESTERN EUROPE</u>						
Sweden	330	329	217	224	264	
Finland	115	123	117	130	127	
West Germany	72	92	74	41	65*	
Norway	44	34	34	29	34	
Denmark	45	40	37	33	30*	
Belgium	6	6	4	37	17	
Netherlands	23	20	18	14	12	
France	11	10	8	12	10*	
Spain	4	6	7	5*	5*	
Italy	5	5	3	2	6*	
Sub-Total	655	665	519	527	505*	
<u>EASTERN EUROPE</u>						
East Germany	36	25*	15*	20*	25*	
Czechoslovakia	10*	10*	10*	10*	10*	
Bulgaria	2	6	8	8	8*	
U.S.S.R.	130	180*	40*	125*	30*	
Sub-Total	178	221	73	163	73*	



TABLE NO. 35 (contd.)

(in metric tonnes)						
Country	1957	1958	1959	1960	1961	1962
<u>ASIA</u>						
Arabian States	444	832	698	961	1022	953
Hong Kong	300*	300*	545	216	231	236
Malaysia	284	244	301	274	82	200*
Japan	13	17	26	24	33	16*
Jordan	23	14	21	25	29	44
Pakistan	4	20	61	199	257	268
Syria	12	12	13	10	10	23
Afghanistan	24	65	66	53	42	12
China (Taiwan)	15	7	12	17	17	27
Burma	5	11	14	3	22	24
Iran	30	57	47	56	53	76
Iraq	22	34	30	41	45	98
Lebanon	6	3	7	9	15	9
Thailand	15	5	1	2	11	10
Israel	-	-	1	-	-	-
India	4	-	-	-	2	2
Sub-Total	1201	1621	1843	1890	1871	1998
U.S.A.	73	57	67	83	87	74
Other countries	15	3	1	-	-	-
Total (World)	1830	2236	2537	2631	2708	2833

Country	1963	1964	1965	1966	1967
<u>ASIA</u>					
Arabian States	1136	1140	840	817	1062*
Hong Kong	120	271	182	231	200*
Malaysia	200*	56*	54*	85*	50*
Japan	36*	28*	32*	37*	37*
Jordan	25	50	21	35	33*
Pakistan	261	246	173	3	N
Syria	17	19	7	45	25*
Afghanistan	36	45*	134*	115*	11*
China (Taiwan)	19	28	44	30*	30*
Burma	5*	10*	5*	5*	5*
Iran	40*	40*	35*	35*	35*
Iraq	60	36	10*	30*	20*
Lebanon	15*	10*	10*	10*	10*
Thailand	11	-	-	-	-
Israel	-	3	6	10	-
India	-	-	23	-	-
Sub-Total	1976	1982	1576	1488	1518
U.S.A.	54	83	53	95	110*
Other countries	2	-	-	-	-
Total (World)	2865	2951	2221	2273	2216

Note: \*Estimated on the basis of data available from exporting countries.



TABLE NO. 36

CARDAMOM: WORLD PRODUCTION AND EXPORTS

(Qty. in '000 tonnes)					
Countries	1951	1960	1965	1970	1975
<u>WORLD PRODUCTION</u>					
India	1.50	3.30	2.00	3.00	3.50
Ceylon	0.50	1.72	1.60	1.75	2.00
Guatemala	0.02	0.40	0.40	0.45	0.45
Thailand	0.40	..	0.10	0.20	0.20
Total	2.42	5.42	4.10	5.40	6.15
<u>WORLD EXPORTS</u> (In Quantity)					
India	0.71	1.92	1.35	2.30	2.65
Ceylon	0.15	0.16	0.14	0.20	0.32
Guatemala	..	0.45	0.43	0.45	0.45
Thailand	0.36	0.04	0.14	0.15	0.15
Total	1.22	2.57	2.16	3.10	3.57
<u>WORLD EXPORTS</u> (Value in million Rs.)					
India	...	37.4	35.3	96.6	111.0
Ceylon	...	3.6	4.1	...	...
Guatemala	...	3.2	7.3	...	...
Thailand	...	0.3	0.4	...	...
Total	...	44.5	47.1	..	..
<u>MAJOR MARKETS</u> (Imports in '000 tonnes)					
Kuwait	...	0.38	0.29	0.46	0.50
Saudi Arabia	0.15	0.68	0.49	0.80	0.95
Sweden	0.10	0.29	0.22	0.24	0.30





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